



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.01.2012 Bulletin 2012/03

(51) Int Cl.:
A46B 3/18 (2006.01)
A46B 9/02 (2006.01)
A46B 7/04 (2006.01)

(21) Application number: **10172085.2**

(22) Date of filing: **05.08.2010**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
BA ME RS

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(30) Priority: **12.07.2010 JP 2010157734**

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(54) **Mascara brush**

(57) In this mascara brush (1,11,21,31), a large number of the brush bristle materials (5,15,25,35) are radially provided around a core material (6,16,26,36). The mascara brush (1,11,21,21) has a brush portion (4,14,24,34) which is constituted of the radial brush bristle materials (5,15,25,35) gathered around the core material (6,16,26,36) and formed into a bundle along a core axial direction (L1,L21,L31). Around the brush portion (4,14,24,34), there is a space around (7,17a,17b,27a,37) the core material (6,16,26,36) along the core axial direction (L1,L21,L31). The brush portion (4,14,24,34) may have hook portions (5b) bent like hooks at the front ends of the radial brush bristle materials (5,15,25,35). The brush portion (4,14,24,34) may be configured so that, as viewed from the core axial direction (L1,L21,L31), a central portion of the radial brush bristle materials (5,15,25,35) is long, and the radial brush bristle materials (5,15,25,35) are gradually shortened from the central portion toward the sides.

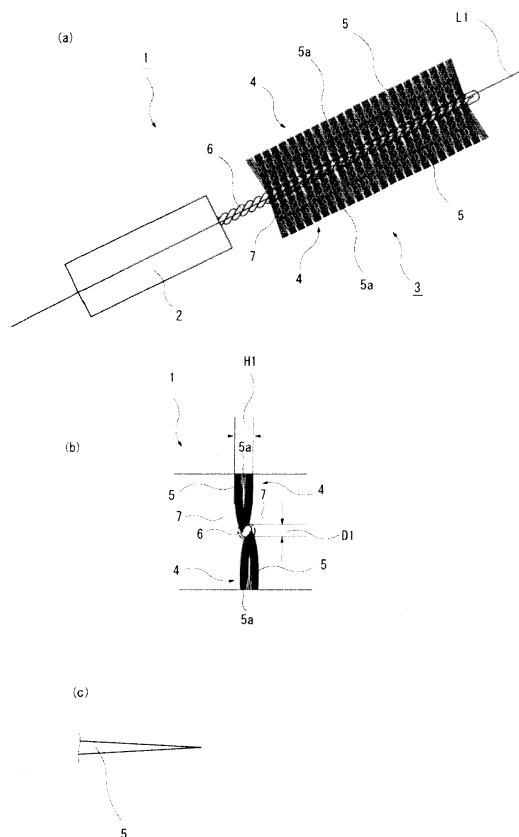


Fig.1

Description

BACKGROUND OF THE INVENTION

[0001] This invention particularly relates to a mascara brush which is used for applying an application liquid, such as mascara, to hair to be applied with the application liquid or is used for cleaning the application liquid.

[0002] In the conventional mascara brush, as disclosed in Japanese Patent Application Laid-Open No. 5-228018, a large number of brush bristle materials are usually held by a double-folded core material, the core material is twisted so that the large number of the brush bristle materials are radiated from the core material, and the base end of the core material is embedded and fixed into a handle.

[0003] In the above mascara brush, since the brush bristle materials continue spirally, the lower surfaces of eyelashes are applied with an application liquid or cleaned with a cleaning liquid with the front ends of the brush bristle materials. Thus, in the application of mascara, only substantially lower surfaces of eyelashes are applied with mascara, for example, and, also in the cleaning, only the lower surfaces of eyelashes are cleaned, and the cleaning liquid on the side and upper surfaces cannot be wiped. Further, the mascara brush has a circular cross section, and therefore, if the mascara brush is not rotated, the application of the application liquid and the wiping of the cleaning liquid cannot be performed.

[0004] In view of the above problems, an object of the present invention is to provide a mascara brush which, when an application liquid is applied with the front ends of brush bristle materials, can apply a large amount of the application liquid held in the mascara brush without being rotated and which, when cleaning is performed with the front ends of brush bristle materials, can perform cleaning with a large amount of a cleaning liquid held in the mascara brush without being rotated.

[0005] In order to solve the above problem and achieve the object, in the mascara brush of the present invention, a large number of brush bristle materials are radially provided around a core material, and the mascara brush includes a brush portion which includes the radial brush bristle materials gathered around the core material and formed into a bundle along a core axial direction. Around the brush portion, there is a space around the core material along the core axial direction.

[0006] In the brush portion, it is preferable that the front ends of the radial brush bristle materials are each pointed like a needle. Further, the brush portion may have hook portions bent like hooks at the front ends of the radial brush bristle materials. Furthermore, the brush portion may be configured so that, as viewed from the core axial direction, a central portion of the radial brush bristle materials is long, and the radial brush bristle materials are gradually shortened from the central portion toward the sides.

[0007] A plurality of the brush portions are provided, and the brush portions may be located symmetrically around the core material as viewed from the core axial direction. Further, a plurality of the brush portions are provided, and the brush portions may be located at a position forming an acute angle with the core material as the center as viewed from the core axial direction. Furthermore, a plurality of the brush portions are provided, and the brush portions may be located at the positions of the vertexes of a polygon as viewed from the core axial direction. Furthermore, a plurality of the brush portions are provided, and the brush portions may be located at regular intervals along a circumference of a circle as viewed from the core axial direction. Still furthermore, a plurality of the brush portions are provided, and the brush portions are located at regular intervals along a circumference of a semicircle as viewed from the core axial direction.

[0008] In the brush portion, the radial brush bristle materials are processed by at least one of pressurization, heating, ultrasound, and high frequency wave to be gathered around the core material, and, thus, to be formed into a bundle along the core axial direction. The brush portion may have a plurality of transverse grooves radially extending from the core material.

[0009] In the brush portion, a plurality of transverse grooves radially extending from the core material are formed in the radial brush bristle materials by processing using a groove forming tool, and the brush portion is in a state where the groove forming tool is not attached thereto. Further, in the brush portion, the core material is held by a brush cover having a groove forming part, whereby a plurality of transverse grooves radially extending from the core material are formed in the radial brush bristle materials, and the brush portion is in a state where the brush cover is attached thereto.

[0010] According to the above constitutions, in the brush portion, the radial brush bristle materials are gathered around the core material to be formed into a bundle along the core axial direction. When an application liquid is applied to eyelashes, the bundle-shaped brush portion holds a large amount of the application liquid, and, in addition, around the brush portion, there is a space around the core material along the core axial direction, whereby the application liquid can be applied to the lower surface of the eyelashes without the brush portion being rotated. When the eyelashes are cleaned with a cleaning liquid, the bundle-shaped brush portion holds a large amount of the cleaning liquid, and the lower, side, and upper surfaces of the eyelashes are cleaned by the side surface of the brush portion without the brush portion being rotated, and thereafter, the used cleaning liquid can be wiped with the brush portion.

[0011] In the brush portion, when the front ends of the radial brush bristle materials are each pointed like a needle, eyelashes are combed by the needle-like front ends, so that liquid application and cleaning can be finely performed.

Further, when the brush portion has hook portions bent like hooks at the front ends of the radial brush bristle materials, the hook portions entangle the eyelashes, so that liquid application and cleaning can be effectively performed. Furthermore, in the brush portion, as viewed from the core axial direction, a central portion of the radial brush bristle materials is long, and the radial brush bristle materials are gradually shortened from the central portion toward the sides. Accordingly, the front end portion of the brush portion is pointed, and the eyelashes are combed by the front end portion of the brush portion, so that liquid application and cleaning can be finely performed.

[0012] Further, a plurality of the brush portions are provided, and the brush portions are located symmetrically around the core material as viewed from the core axial direction, so that a large space is secured. Accordingly, a large amount of an application liquid contained in the brush portions can be applied, and likewise cleaning can be performed with a large amount of a cleaning liquid contained in the brush portions. The lower, side, and upper surfaces of eyelashes are cleaned by the side surface of the brush portion, and thereafter, the used cleaning liquid can be wiped with the brush portion. Since the brush portion is not rotated in the liquid application and cleaning, the eyelashes are not damaged.

[0013] Furthermore, a plurality of the brush portions are provided, and the brush portions are located at a position forming an acute angle with the core material as the center as viewed from the core axial direction, so that a space is secured between the brush portions. Accordingly, a large amount of an application liquid contained in the brush portions can be applied, and likewise cleaning can be performed with a large amount of a cleaning liquid contained in the brush portions. The lower, side, and upper surfaces of eyelashes are cleaned by the side surface of the brush portion, and thereafter, the used cleaning liquid can be wiped with the brush portion. Since the brush portion is not rotated in the liquid application and cleaning, the eyelashes are not damaged.

[0014] Furthermore, in a mascara brush wherein a plurality of the brush portions are provided, and the brush portions are located at the positions of the vertexes of a polygon as viewed from the core axial direction; a plurality of the brush portions are provided, and the brush portions are located at regular intervals along a circumference of a circle as viewed from the core axial direction; or a plurality of the brush portions are provided, and the brush portions are located at regular intervals along a circumference of a semicircle as viewed from the core axial direction, a large space is secured between the brush portions. Accordingly, large amount of an application liquid contained in the brush portions can be applied, and likewise cleaning can be performed with a large amount of a cleaning liquid contained in the brush portions. The lower, side, and upper surfaces of eyelashes are cleaned by the side surface of the brush portion, and thereafter, the used cleaning liquid can be wiped with the brush portion. Since the brush portion is not rotated in the liquid application and cleaning, the eyelashes are not damaged. Depending on the arrangement position of the brush portions, the both sides of the brush portion are inclined, the brush bristle materials are shorter as they get closer to the core axis in a brush center direction, and the brush bristle materials are thickly provided. Accordingly, when an application liquid or a cleaning liquid is used, eyelashes can be finely combed. Thus, if one wants to comb eyelashes coarsely, the eyelashes are combed with the front end of the brush portion where the brush bristle materials are not thickly provided. If one wants to comb eyelashes finely, the brush portion is deeply inserted into the eyelashes, and the eyelashes are combed with the portion where the brush bristle materials are thickly provided. In the brush portion, the radial brush bristle materials are processed by at least one of pressurization, heating, ultrasound, and high frequency wave to be reliably gathered around the core material, and, thus, to be formed into a bundle along the core axial direction.

[0015] The brush portion has a plurality of transverse grooves radially extending from the core material. A large amount of an application liquid or a cleaning liquid is contained in the transverse grooves, and the application liquid can be applied to eyelashes, or the eyelashes can be cleaned with the cleaning liquid. In the brush portion, the transverse grooves radially extending from the core material are formed in the radial brush bristle materials by processing using a groove forming tool, and the brush portion is in a state where the groove forming tool is not attached thereto. The brush portion is free from the groove forming tool, so that the weight is reduced, resulting in ease of use.

[0016] In the brush portion, the core material is held by a brush cover, whereby the transverse grooves radially extending from the core material are formed in the radial brush bristle materials. Since the brush portion is in a state where the brush cover is attached thereto, the deformation of the transverse grooves by the use is prevented, and the durability is enhanced.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

FIG. 1 is a view showing a constitution of a mascara brush of a first embodiment;

FIG. 2 is a view for explaining a method of fabricating the mascara brush;

FIG. 3 is a view for explaining use of the mascara brush;

FIG. 4 is a view for explaining a constitution of a set of variations 1 of the first embodiment;

FIG. 5 is a view for explaining a constitution of a set of variations 2 of the first embodiment;

FIG. 6 is a view for explaining a constitution of a set of variations 3 of the first embodiment;

FIGS. 7A and 7B are views showing the mascara brush of the first embodiment;
 FIGS. 7C to 7E are views for explaining a method of fabricating the mascara brush of the first embodiment;
 FIG. 8 is a view for explaining use of the mascara brush of the first embodiment;
 FIGS. 9A to 9D are views for explaining a constitution of a set of variations 1 of a second embodiment;
 FIGS. 9E and 9F are views for explaining a constitution of a set of variations 2 of the second embodiment;
 FIGS. 10A and 10B are views showing a mascara brush of a third embodiment;
 FIGS. 10C to 10E are views for explaining a method of fabricating the mascara brush of the third embodiment;
 FIGS. 11A and 11B are views showing a mascara brush of a fourth embodiment;
 FIGS. 11C to 11E are views for explaining a method of fabricating the mascara brush of the fourth embodiment;
 FIG. 12 is a view showing a constitution of a mascara brush of a fifth embodiment;
 FIG. 13 is a view for explaining a method for fabricating the mascara brush of the fifth embodiment;
 FIG. 14 is a view for explaining the constitution of the mascara brush of the fifth embodiment;
 FIG. 15 is a view for explaining a constitution of a brush cover; and
 FIG. 16 is a view for explaining a constitution of a set of variations 1 of the fifth embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] Hereinafter, embodiments of a mascara brush of the present invention will be described. The embodiments of the present invention represent the best modes of the present invention, and the present invention is not limited to the embodiments.

[First embodiment]

(Constitution of mascara brush)

[0019] The first embodiment will be described based on FIG. 1. A mascara brush 1 of the present embodiment has a grip portion 2 and a brush body 3 provided at the front end of the grip portion 2 and formed to have, as the entire appearance shape, a substantially rectangular-shaped cross-section from the hand side to the front end side. The brush body 3 has two brush portions 4. In the brush portions 4, a large number of brush bristle materials 5 are radially provided around a core material 6. The radial brush bristle materials 5 are gathered around the core material 6 to be formed into a bundle along a core axial direction L1. Around the brush portions 4, there are spaces 7 along the core axial direction L1 around the core material 6.

[0020] In the brush portion 4, the radial brush bristle materials 5 are processed by at least one of pressurization, heating, ultrasound, and high frequency wave to be gathered around the core material 6, and, thus, to be formed into a bundle along the core axial direction L1. In this embodiment, the brush bristle materials 5 are gathered so as to correspond to the width of the core material 6, and the brush portions 4 are each formed into a plate shape.

[0021] The two brush portions 4 are located symmetrically around the core material 6 so as to be arranged linearly. As shown in FIG. 1B, the brush portion 4 is formed so that thickness H1 of the plate-shaped portion constituted of the large number of the brush bristle materials 5 is larger than a diameter D1 of the core material 6. If the thickness H1 of the plate-shaped portion is substantially the same as the diameter D1 of the core material 6, liquid application into a small gap and cleaning of the gap can be performed. When the thickness H1 is substantially three times larger than the diameter D1, liquid application into a large gap and cleaning of the gap can be performed.

[0022] The brush portions 4 are arranged so that front ends 5a of the large number of the brush bristle materials 5 are formed into a planar shape, and, at the same time, arranged in parallel along the core axial direction L1 of the core material 6 from the hand side to the end. The two brush portions 4 are formed in the symmetrical positions around the core material 6, and the spaces 7 are easily secured between the two brush portions 4 formed in the symmetrical positions. In the brush portion 4, as shown in FIG. 1C, when the front ends of the large number of the radial brush bristle materials 5 are each pointed like a needle, eyelashes are combed by the needle-like front ends, so that an application liquid can be finely applied to the eyelashes, or the eyelashes can be finely cleaned.

(Method of fabricating mascara brush)

[0023] Next, a method of fabricating the mascara brush 1 will be described based on FIG. 2. In the case of the present embodiment, in the brush body 3, the core material 6 having a diameter of 0.1 to 2.0 [mmφ] and constituted of a stainless steel wire material is folded in half, and the large number of the brush bristle materials 5 formed of brush fiber materials are held between the folded core material 6 so as to be arranged in the extension direction of the core material 6 (FIG. 2A). In this state, the core material 6 is processed to be twisted, and the brush bristle materials 5 are implanted around the twisted core material 6 so as to protrude outward linearly, so that the large number of the brush bristle materials 5

are radially provided around the core material 6 (FIG. 2B).

[0024] In the large number of the brush bristle materials 5 formed of brush fiber materials, one end may be pointed like a needle (FIG. 2C), or the both ends may be pointed like a needle (FIG. 2D). As the brush fiber material, a fiber material of a synthetic resin material (such as nylon, Tetoron, polyester, and polypropylene) of 0.028 to 0.3 [mmφ] can be used. For the core material 6 and the brush bristle materials 5, the material, size, shape, and so on are freely selected depending on the intended use of a brush tool.

[0025] When the large number of the brush bristle materials 5 are radially provided around the core material 6, the brush bristle materials 5 are formed into a perfect circular shape as viewed from the core axial direction of the core material 6. Four forming tools 50 are inserted into the large number of the brush bristle materials 5 in the direction of the core material 6 (FIG. 2E), and the radial brush bristle materials 5 are gathered around the core material 6 using the four forming tools 50. An electric current is applied to the four forming tools 50, whereby Joule heat is generated to perform heating and, thus, to pressurize and heat the gathered radial brush bristle materials 5 so that the brush bristle materials 5 have a plate shape (FIG. 2F). In this way, as shown in FIG. 1, the brush portions 4 are formed by forming the large number of the brush bristle materials into a plate shape along the core axial direction of the core material 6 by pressurization and heating. The brush portions 4 are formed in the symmetrical positions around the core material 6, and the spaces 7 along the core axial direction L1 around the core material 6 are formed between the brush portions 4 formed in the symmetrical positions.

[0026] In the present embodiment, an electric current is applied to the forming tools 50 to thereby generate Joule heat, and, thus, to pressurize and heat the gathered radial brush bristle materials 5 so as to be formed into a bundle. However, the gathered radial brush bristle materials 5 may be pressurized so as to be formed into a bundle, or while the radial brush bristle materials 5 are gathered, the base ends of the brush bristle materials 5 are heated to be softened and bent, whereby the radial brush bristle materials 5 may be formed into a bundle.

[0027] Further, while the radial brush bristle materials 5 are gathered, ultrasound or a high frequency wave is applied to the base ends of the brush bristle materials 5, and the brush bristle materials 5 are plastically deformed by the ultrasound or the high frequency wave, whereby the base ends of the brush bristle materials 5 are bent, so that the radial brush bristle materials 5 may be formed into a bundle.

(Use of mascara brush)

[0028] The use of the mascara brush 1 will be described based on FIG. 3. In a case where the mascara brush 1 is used for liquid application, in order to adhere an application liquid to the bundle-shaped brush bristle materials 5, for example, the brush body 3 is inserted into a liquid container storing the application liquid, and the brush body 3 is removed from the liquid container while the application liquid is adhered to the brush portions 4. However, when the brush body 3 is removed, the brush bristle materials 5 of the bundle-shaped brush portions 4 are scraped off by a rubber packing and so on provided at an opening of the liquid container. After the scraping, pools of the application liquid are formed in the brush bristle materials 5 of the bundle-shaped brush portions 4, and thus a large amount of the application liquid can be applied to eyelashes 60. After the application, the eyelashes 60 are combed one by one by the brush bristle materials 5 of the bundle-shaped brush portions 4, whereby the application liquid can be uniformly applied to the eyelashes.

[0029] In particular, when the application liquid is applied to the eyelashes 60, as shown in FIG. 3A, a large amount of the application liquid is contained in the brush bristle materials 5 of the bundle-shaped brush portions 4, and in addition, around the bundle-shaped brush portions 4, there are the spaces 7 around the core material 6 along the core axial direction. Therefore, the bundle-shaped brush portions 4 can be moved in the direction of the arrow on the FIG. 3A without being rotated, and the application liquid can be applied to the eyelashes 60 with the side surfaces of the bundle-shaped brush portions 4.

[0030] Further, in the brush portions 4, since the thickness H1 of the plate-shaped portion formed by the large number of the brush bristle materials 5 is larger than the diameter D1 of the core material 6, the eyelashes 60 are combed one by one by a larger number of the brush bristle materials 5 of the brush portions 4, whereby the application liquid can be more uniformly applied to the eyelashes 60.

[0031] Furthermore, in the brush portions 4, the front ends 5a of the large number of the brush bristle materials 5 are arranged to have a planar shape. When the brush portions 4 are used as a liquid application brush, the large number of the brush bristle materials 5 all have the same length, and therefore, the many eyelashes 60 are combed one by one by the brush bristle materials 5, whereby the application liquid can be more uniformly applied to the eyelashes 60.

[0032] When the eyelashes 60 are cleaned with a cleaning liquid, as shown in FIG. 3B, a large amount of the cleaning liquid is contained in the bundle-shaped brush portions 4, and around the bundle-shaped brush portions 4, there are the spaces 7 around the core material 6 along the core axial direction. Therefore, the side surface of the bundle-shaped brush portion 4 is first moved in the direction of the arrow on the FIG. 3B without the bundle-shaped brush portion 4 being rotated to clean the lower, side, and upper surfaces of the eyelashes, and thereafter, the brush portions 4 can

wipe the used cleaning liquid. Since the brush portions 4 are not rotated in the liquid application and cleaning, the eyelashes are not damaged.

(Variation 1 of first embodiment)

[0033] Next, a set of variations 1 of the first embodiment will be described based on FIG. 4. In the set of variations 1 of the first embodiment, the two brush portions 4 are located symmetrically around the core material 6 so as to be arranged linearly, and the brush portions 4 are gathered so as to correspond to the width of the core material 6 and each formed into a plate shape.

[0034] The brush portions 4 of FIG. 4A have hook portions 5b bent like hooks at the front ends of the radial brush bristle materials 5. The hook portions 5b entangle the eyelashes 60, so that an application liquid can be effectively applied to the eyelashes 60, or the eyelashes 60 can be effectively cleaned. In the brush portion 4 of FIG. 4B, as viewed from the core axial direction L1, a central portion of the radial brush bristle materials 5 is long, and the radial brush bristle materials 5 are gradually shortened from the central portion toward the both sides. Accordingly, the front end portions 5c of the brush portions 4 are pointed, and the eyelashes 60 are combed by the front end portions 5c of the brush portions 4, whereby liquid application and cleaning can be finely performed.

[0035] In the brush portions 4 of FIG. 4C, front end portions 5d of the radial brush bristle materials 5 are extended outward. The extended front end portions 5d are inserted in between the eyelashes 60, so that an application liquid can be effectively applied to the eyelashes 60, or the eyelashes 60 can be effectively cleaned.

[0036] In the mascara brush 1 of FIG. 4D, short brush bristle material portions 5e are provided between the two brush portions 4 around the core material 6. The application liquid or the cleaning liquid is stored in the short brush bristle material portions 5e, and the eyelashes can be applied or cleaned with the short brush bristle material portions 5e. As with the mascara brush 1 of FIG. 4D, the mascara brush 1 of FIGS. 4E and 4F has short brush bristle material portions 5f provided around the core material 6. In the example of FIG. 4E, the short brush bristle material portions 5f are provided between the two brush portions 4 so as to extend in the orthogonal direction. In the example of FIG. 4F, the short brush bristle material portions 5f are provided so as to extend obliquely in two directions between the two brush portions 4. The mascara brush 1 of FIG. 4F has an effect similar to that of the mascara brush 1 of FIG. 4D.

[0037] In the mascara brush 1 of FIG. 4G, one of the two brush portions 4 is shorter than the other one. In the mascara brush 1 of FIG. 4H, a single brush portion 4 is provided, and the space 7 is provided around the core material 6 along the core axial direction.

[0038] In the mascara brush 1 of FIG. 4I, the two brush portions 4 are bent into a wave shape as viewed from the core axial direction. Since the application liquid or the cleaning liquid is stored in the two brush portions 4, the eyelashes can be applied or cleaned with the application liquid or the cleaning liquid stored in the two brush portions 4.

(Variation 2 of first embodiment)

[0039] Next, a set of variations 2 of the first embodiment will be described based on FIG. 5. In the variations 2 of the first embodiment, the brush portions 4 are gathered so as to correspond to the width of the core material 6 and each formed into a plate shape. Although the brush portions 4 each have a rectangular shape, the rectangle is deformed, or other brush bristle materials are added to the brush portions 4. In this set of variations, the same components as those in the set of variations 1 of the first embodiment are assigned the same reference numerals, and the description will not be repeated.

[0040] In the example of FIG. 5A, although the two brush portions 4 are located symmetrically to each other, the brush portions 4 are tapered toward the front end. In the example of FIG. 5B, the brush portions 4 are tapered from the hand side toward the front end. In the example of FIG. 5C, the central portions of the brush portions 4 are narrowed. According to those examples, liquid application and cleaning can be effectively performed utilizing the changed tapered portion of the brush portions 4.

[0041] In the example of FIG. 5D, although the central portions of the brush portions 4 to the front end side are similar to those of the example of FIG. 5C, the brush bristle materials 5 are radiated from the central portions of the brush portions 4 to the hand side. In the example of FIG. 5E, the four brush portions 4 are located symmetrically to each other from the central portions to the front end side and tapered toward the front ends, and the brush bristle materials 5 shorter than the brush portions 4 are radiated from the central portion to the hand side. In the example of FIG. 5F, the four brush portions 4 are located symmetrically to each other from the central portion to the hand side. One pair of facing brush portions 4 is shorter than another pair of facing the brush portions 4, and the brush bristle materials 5 shorter than the brush portions 4 are radiated from the central portion to the front end side.

[0042] In the example of FIG. 5G, the four brush portions 4 are located symmetrically to each other from the central portion to the hand side. Although the constitution is similar to that of the example of FIG. 5F, the brush bristle materials 5 are radiated so that the front end side is tapered from the same length as the brush portion 4. According to those

embodiments, liquid application and cleaning of plaque can be effectively performed utilizing the brush portions 4 and the radiated portion of the brush bristle materials 5.

[0043] In the example of FIG. 5H, the brush portions 4 are formed spirally around the core material 6, and the brush portions 4 are changed into various shapes. The brush portions 4 are formed spirally around the core material 6, and therefore, in the case where the brush portions 4 are used as a liquid application brush, when the brush body is removed from a liquid container, the brush bristle materials 5 of the brush portions 4 are scraped off by a rubber packing and so on provided at an opening of the liquid container. After the scraping, pools of an application liquid are formed in the brush bristle materials 5 of the brush portions 4, and, at the same time, pools of the application liquid or a cleaning liquid are formed between the spiral brush portions 4. By virtue of the liquid pools, a large amount of the application liquid can be applied to eyelashes 60, and the eyelashes 60 are combed one by one while the brush bristle materials 5 of the brush portions 4 are operated to be rotated, whereby the application liquid or the cleaning liquid can be uniformly applied to the eyelashes 60.

(Variation 3 of first embodiment)

[0044] Next, a set of variations 3 of the first embodiment will be described based on FIG. 6. In the set of variations 3 of the first embodiment, although the brush portions are gathered so as to correspond to the width of the core material 6 and each formed into a plate shape, other members are added. In this set of variations, the same components as those in the set of variations 2 of the first embodiment are assigned the same reference numerals, and the description will not be repeated.

[0045] In the example of FIG. 6A, the brush body 3 has two brush portions located symmetrically to each other. The core material 6 is disposed so as to be located at a shaft portion 70 as a forming die. The end of the brush body 3 protrudes forward from the shaft portion 70, and the shaft portion 70 has a large number of protrusions 70a. The two brush portions 4 are tapered at the front end of the brush body 3.

[0046] In the example of FIG. 6B, as with the example of FIG. 6A, the core material 6 is disposed so as to be located at the shaft portion 70 as a forming die, and the shaft portion 70 has a large number of grooves 70b continuously provided in the axial direction of the shaft portion 70. In the example of FIG. 6C, the brush body 3 has a single brush portion 4. The core material 6 is disposed at the semicircular shaft portion 70 as a forming die. The end of the brush body 3 protrudes forward from the shaft portion 70. The shaft portion 70 has a large number of grooves 70b continuously provided in the axial direction of the shaft portion 70.

[0047] In the example of FIG. 6D, the brush body 3 has a single brush portion 4, the core material 6 is disposed at the semicircular shaft portion 70 as a forming die, and the shaft portion 70 has a large number of the protrusions 70a. In the example of FIG. 6E, the brush body 3 has a single brush portion 4, the core material 6 is disposed at the semicircular shaft portion 70 as a forming die, and the shaft portion 70 has a comb 72. In the example of FIG. 6F, the brush body 3 has a single brush portion 4, and the core material 6 is disposed so as to be located between the left and right combs 72.

[0048] As described above, the brush portion 4 is configured to be combined with a comb for use in applying an application liquid or an application portion, which is a forming die, in the axial direction. Therefore, a large amount of an application liquid is applied to eyelashes using the comb or the application portion as a forming die, and the eyelashes are combed one by one by the brush bristle materials 5 of the brush portion 4, whereby the application liquid can be uniformly applied to the eyelashes, or the eyelashes can be cleaned.

[Second embodiment]

(Constitution of mascara brush)

[0049] The second embodiment will be described based on FIGS. 7A and 7B. A mascara brush 11 of the present embodiment has a grip portion 12 and a brush body 13 provided at the front end of the grip portion 12 and formed to have, as the entire appearance shape, a substantially rectangular-shaped cross-section from the hand side to the front end side. The brush body 13 has two brush portions 14. In the brush portions 14, a large number of brush bristle materials 15 are radially provided around a core material 16. The radial brush bristle materials 15 are gathered around the core material 16 to be formed into a bundle along a core axial direction L21. Around the brush portions 14, there are spaces 17a and 17b along the core axial direction L21 around the core material 6.

[0050] As with the first embodiment, in the brush portions 14, the radial brush bristle materials 15 are processed by at least one of pressurization, heating, ultrasound, and high frequency wave to be gathered around the core material 16, and, thus, to be formed into a bundle along the core axial direction L21.

[0051] The two brush portions 14 are located at a position forming an acute angle with the core material 16 as the center as viewed from the core axial direction. In the present embodiment, the brush portions 14 are located at a position forming a V shape with the core material 6 as the center. The narrow space 17a is secured between the brush portions

14 located at a position forming an acute angle, and the large space 17b is secured around the two brush portions 14. The brush portions 4 are arranged so that the front end portions 5a of a large number of the brush bristle materials 15 are each formed into a planar shape.

5 method of fabricating mascara brush)

[0052] Next, a method of fabricating the mascara brush 11 will be described based on FIGS. 7C, 7D, and 7E. In the case of the present embodiment, in the brush body 13, a large number of the brush bristle materials 15 are radially provided around the core material 16. As viewed from the core axial direction of the core material 16, the large number of the brush bristle materials 15 are formed into a perfect circular shape (FIG. 7C). The three forming tools 50 are inserted into the large number of the brush bristle materials 15, having a perfect circular shape, in the direction of the core material 16 (FIG. 7D), and the forming tools 50 on both sides are moved toward the central forming tool 50 to apply heat to the three forming tools 50, and, thus, to pressurize and heat the gathered radial brush bristle materials 15 so that the brush bristle materials 15 are formed into a plate shape (FIG. 7E). In this way, as shown in FIG. 7, the two brush portions 14 are formed by forming the large number of the brush bristle materials 15 into a plate shape along the core axial direction of the core material 16 by pressurization and heating.

(Use of mascara brush)

[0053] In the mascara brush 11, when an application liquid is applied to the eyelashes 60, as shown in FIG. 8A, the space 17a is secured between the brush portions 14, and the application liquid is stored in the space 17a, so that a large amount of the application liquid is supplied from the space 17a to the brush portions 14 to be contained in the brush portions 14. In addition, around the brush portions 14, there is the space 17b around the core material 16 along the core axial direction. Therefore, the brush portions 14 are moved in the direction of the arrow on FIG 8A without being rotated, and the application liquid can be applied to the eyelashes 60 by the side surface of the brush portion 14.

[0054] When the eyelashes 60 are cleaned with a cleaning liquid, as shown in FIG. 8B, the cleaning liquid is stored in the space 17a between the bundle-shaped brush portions 14, so that a large amount of the cleaning liquid is supplied from the space 17a to the brush portions 14 to be contained in the brush portions 14. In addition, around the brush portions 14, there is the space 17b around the core material 16 along the core axial direction. Therefore, the side surface of the bundle-shaped brush portion 14 is first moved in the direction of the arrow on FIG 8B without the bundle-shaped brush portion 4 being rotated to clean the lower, side, and upper surfaces of the eyelashes, and thereafter, the brush portions 14 can wipe the used cleaning liquid. Since the brush portion 14 is not rotated in the liquid application and cleaning, the eyelashes are not damaged.

35 (Variation 1 of second embodiment)

[0055] Next, a set of variations of the second embodiment will be described based on FIGS. 9A to 9D. In the set of variations 1 of the second embodiment, as viewed from the core axial direction, a plurality of the brush portions 14 are located at a position forming an acute angle with the core material 16 as the center, and the brush portions 14 each have a rectangular shape.

[0056] In the example of FIG. 9A, as viewed from the core axial direction, the three brush portions 14 are located at a position forming an acute angle with the core material 16 as the center, the spaces 17a are provided between the three brush portions 14, and around the brush portions 14, there is the space 17b around the core material 16 along the core axial direction.

[0057] In the example of FIG. 9B, as viewed from the core axial direction, the four brush portions 14 are located at a position forming an acute angle with the core material 16 as the center, the spaces 17a are provided between the four brush portions 14, and around the brush portions 14, there is the space 17b around the core material 16 along the core axial direction.

[0058] In the example of FIG. 9C, as viewed from the core axial direction, the two brush portions 14 are located at a position forming an acute angle with the core material 16 as the center, and the brush portions 14 are further located symmetrically around the core material 16. The space 17a is provided between the two brush portions 14, and around the brush portions 14, there is the space 17b around the core material 16 along the core axial direction.

[0059] In the example of FIG. 9D, as viewed from the core axial direction, the two brush portions 14 are located at a position forming an acute angle with the core material 16 as the center. However, in one of the brush portions 14, the brush bristle materials 15 are radially provided around the core material 16, and only around the brush portion 14, there is the space 17b around the core material 16 along the core axial direction.

(Variation 2 of second embodiment)

[0060] Next, a set of variations 2 of the second embodiment will be described based on FIGS. 9E and 9F. In the set of variations 2 of the second embodiment, as viewed from the core axial direction, a plurality of the brush portions 14 are located at a position forming an acute angle with the core material 16 as the center; however, the brush portions 14 are gathered. In this set of variations, the same components as those in the set of variations 1 of the second embodiment are assigned the same reference numerals, and the description will not be repeated.

[0061] In the example of FIG. 9E, as viewed from the core axial direction, the two brush portions 14 are located at a position forming an acute angle with the core material 16 as the center to be gathered and integrated. Further, the brush portions 14 are located symmetrically around the core material 16, and the spaces 17b are provided between the two gathered brush portions 14.

[0062] In the example of FIG. 9F, as viewed from the core axial direction, the brush portions 14 are gathered and integrated around the core material 16, and around the brush portion 14, there is the space 17b around the core material 16.

[Third embodiment]

(Constitution of mascara brush)

[0063] The third embodiment will be described based on FIGS. 10A and 10B. A mascara brush 21 of the present embodiment has a grip portion 22 and a brush body 23 provided at the front end of the grip portion 22 and formed to have, as the entire appearance shape, a substantially rectangular-shaped cross-section from the hand side to the front end side. The brush body 23 has three brush portions 24, and the three brush portions 24 are located at the positions of the vertexes of a triangle as viewed from the core axial direction. In the brush portions 24, a large number of brush bristle materials 25 are radially provided around a core material 26. The radial brush bristle materials 25 are gathered around the core material 26 to be formed into a bundle along a core axial direction L31. Around the brush portions 24, there are spaces 27a along the core axial direction L31 around the core material 26.

[0064] As with the first embodiment, in the brush portions 24, the radial brush bristle materials 25 are processed by at least one of pressurization, heating, ultrasound, and high frequency wave to be gathered around the core material 26, and, thus, to be formed into a bundle along the core axial direction L31. In the present embodiment, the brush bristle materials 25 are gathered so as to correspond to the width of the core material 26, and the brush portions 24 are each formed into a plate shape.

(Method of fabricating mascara brush)

[0065] Next, a method of fabricating the mascara brush 21 will be described based on FIGS. 10C, 10D, and 10E. In the case of the present embodiment, in the brush body 23, a large number of the brush bristle materials 25 are radially provided around the core material 26. As viewed from the core axial direction of the core material 26, the large number of the brush bristle materials 25 are formed into a perfect circular shape (FIG. 10C). The brush bristle materials 25 having a perfect circular shape are cut so as to have a triangle shape as viewed from the core axial direction of the core material 26 (FIG. 10D). The three forming tools 50 are inserted in the direction of the core material 26 (FIG. 10E), and heat is applied to the three forming tools 50 to pressurize and heat the radially gathered brush bristle materials 25 so that the brush bristle materials 25 have a plate shape. In this way, the mascara brush 21 has a constitution that the three brush portions 24 are located at the positions of the vertexes of a triangle as viewed from the core axial direction L31, and the spaces 27a are secured between the three brush portions 24.

(Use of mascara brush)

[0066] In the mascara brush 21, the three brush portions 24 are located at the positions of the vertexes of a triangle as viewed from the core axial direction L31, and the spaces 27a are secured between the three brush portions 24. A large amount of an application liquid is contained in the three brush portions 24, and, at the same time, the application liquid is stored in the spaces 27a, whereby the large amount of the application liquid can be applied. Likewise, cleaning can be performed with a large amount of a cleaning liquid contained in the brush portions.

[0067] The lower, side, and upper surfaces of eyelashes can be applied with an application liquid by the side surface of the brush portion 24 and can be cleaned with a cleaning liquid to thereafter wipe the used cleaning liquid by the side surface of the brush portion 24. Since the brush portion 24 is not rotated in the liquid application and cleaning, the eyelashes are not damaged.

[0068] Further, the both sides of the brush portion 24 are inclined, so that the closer to the core axis in a brush center direction, the shorter the brush bristle materials 25. With this configuration, the brush bristle materials 25 are thickly

provided, whereby when an application liquid or a cleaning liquid is used, eyelashes can be finely combed. Thus, if one wants to comb eyelashes coarsely, the eyelashes may be combed with the front end of the brush portion 24 where the brush bristle materials 25 are not thickly provided. If one wants to comb eyelashes finely, the brush portion 24 is deeply inserted into the eyelashes, whereby the eyelashes can be combed with the portion where the brush bristle materials 25 are thickly provided.

(Variation 1 of third embodiment)

[0069] Next, a set of variations 1 of the third embodiment will be described based on FIGS. 11A and 11B. The mascara brush 21 of the present embodiment has the four brush portions 24. The four brush portions 24 are configured to be located at the positions of the vertexes of a square as viewed from the core axial direction. In the brush portions 24, a large number of the brush bristle materials 25 are radially provided around the core material 26. The radial brush bristle materials 25 are gathered around the core material 26 to be formed into a bundle along the core axial direction L31. Around the brush portions 24, there are the spaces 27a along the core axial direction L31 around the core material 26.

[0070] In the brush portion 24, the radial brush bristle materials 25 are processed by at least one of pressurization, heating, ultrasound, and high frequency wave to be gathered around the core material 26, and, thus, to be formed into a bundle along the core axial direction L31. In the present embodiment, the brush bristle materials 25 are gathered so as to correspond to the width of the core material 26, and the brush portions 24 are each formed into a plate shape.

(Method of fabricating mascara brush)

[0071] Next, a method of fabricating the mascara brush 21 will be described based on FIGS. 11C, 11D, and 11E. In the case of the present embodiment, in the brush body 23, a large number of the brush bristle materials 25 are radially provided around the core material 26. As viewed from the core axial direction of the core material 26, the large number of the brush bristle materials 25 are formed into a perfect circular shape (FIG. 11C). The large number of the brush bristle materials 25 having a perfect circular shape are cut so as to have a square shape as viewed from the core axial direction of the core material 26 (FIG. 11D). The four forming tools 50 are inserted in the direction of the core material 26 (FIG. 11E), and heat is applied to the four forming tools 50 to pressurize and heat the radially gathered brush bristle materials 25 so that the brush bristle materials 25 have a plate shape. In this way, the mascara brush 21 has a constitution that the four brush portions 24 are located at the positions of the vertexes of a square as viewed from the core axial direction L31, and the spaces 27a are secured between the four brush portions 24.

(Variation 2 of third embodiment)

[0072] Next, although a set of variations 2 of the third embodiment will be described, the explanatory views thereof are not shown. In this set of variations, a plurality of brush portions may be located at the positions of the vertexes of a polygon as viewed from the core axial direction. For example, the constitution is similar to that of the set of variations 2 of the second embodiment. In the mascara brush, six brush portions are located at the positions of the vertexes of a hexagon as viewed from the core axial direction, and spaces are secured between the six brush portions. As another example, eight brush portions are located at the position of the vertexes of an octagon as viewed from the core axial direction, and spaces are secured between the eight brush portions. Further, in the mascara brush, the brush portions may be located at the position of the vertexes of a rectangle as viewed from the core axial direction.

[0073] Furthermore, the mascara brush may have a constitution that the bristle brush materials are cut into a depressed or projecting shape by curving each edge of a polygon such as a triangle, a square, and a hexagon, the forming tools are inserted in the core material direction, and the brush portions are located at the position of the vertexes of the polygon as viewed from the core axial direction.

(variation 3 of third embodiment)

[0074] Next, although a set of variations 3 of the third embodiment will be described, the explanatory views thereof are not shown. In the set of variations 3 of the third embodiment, a plurality of brush portions are provided, and the brush portions are arranged at regular intervals along a circumference of a circle as viewed from the core axial direction. This arrangement structure is similar to that of the set of variations 1 of the third embodiment and the set of variations 2 of the third embodiment.

(Variation 4 of third embodiment)

[0075] Next, although a set of variations 4 of the third embodiment will be described, the explanatory views thereof

are not shown. In the set of variations 4 of the third embodiment, a plurality of brush portions are provided, and the brush portions are arranged at regular intervals along a circumference of a semicircle as viewed from the core axial direction. This arrangement structure is similar to that of the set of variations 1 of the third embodiment and the set of variations 2 of the third embodiment.

[Fourth embodiment]

(Constitution of mascara brush)

[0076] The fourth embodiment will be described based on FIG. 12. In the present embodiment, a mascara brush 31 has a grip portion 32 and a brush body 33 provided at the front end of the grip portion 32 and formed to have, as the entire appearance shape, a substantially rectangular-shaped cross-section from the hand side to the front end side. The brush body 33 has two brush portions 34, and the brush portions 34 are located symmetrically around a core material 36 as with the first embodiment. Spaces 37 are easily secured between the brush portions 34 formed in the symmetrical positions. In the brush portions 34, a large number of brush bristle materials 35 are radially provided around the core material 36. The brush portions 34 of the present embodiment are configured to have a plurality of transverse grooves 38 radially extending from the core material 36, and a large amount of an application liquid or a cleaning liquid is contained in the transverse grooves 38, and the application liquid can be applied to eyelashes, or the eyelashes can be cleaned with the cleaning liquid. In the present embodiment, a plurality of the transverse grooves radially extending from the core material are provided at the brush portions of the first to third embodiments.

[0077] The brush portions 34 are processed by a groove forming tool 90, whereby a plurality of the transverse grooves 38 radially extending from the core material 36 are formed in the radial bristle brush materials 35. After the processing, the groove forming tool 90 is removed, whereby the brush portions 34 are free from the groove forming tool 90.

(Method of fabricating mascara brush)

[0078] Next, a method of fabricating the mascara brush 31 will be described based on FIG. 13. In the mascara brush 31 of the present embodiment, the two brush portions 34 are fabricated similarly to those of the first embodiment, and the transverse grooves 38 are formed in the two brush portions 34 by the fabrication procedures shown in FIG. 13. The brush body 33 is provided (FIG. 13A), and for the brush body 33, the coil spring-shaped groove forming tool 90 having a pitch P2 in the longitudinal direction a is provided as shown in FIG. 13B. The groove forming tool 90 is fitted into the brush body 33 as shown in FIG. 13C.

[0079] The groove forming tool 90 is formed by winding a metallic wire helically. The pitch P2 is larger than a pitch P1 (FIG. 13A) of the brush bristle materials 35 of the brush body 33, and, as shown in FIG. 13D, the value is selected to correspond to the transverse groove 38 to be formed in the outer periphery of the brush bristle materials 35. In a diameter D1 of the wire of the groove forming tool 90, the value is selected to correspond to the width in the longitudinal direction of the transverse groove 38 to be formed in the outer periphery of the brush bristle materials 35.

[0080] As shown in FIG. 13C, in such state that the groove forming tool 90 is fitted into the brush body 33, as shown in FIG. 12C, regarding the brush bristle materials 35 protruding outward from the core material 36 of the brush body 33, the brush bristle materials 35 located between the wire portions 90A of the groove forming tool 90 protrude outward through between the wires of the groove forming tool 90 without being affected by the forming operation by the groove forming tool 90 (that is, without suffering interference).

[0081] Meanwhile, regarding the brush bristle materials 35 protruding outward from the core material 36 of the brush body 33, the brush bristle materials 35 abutted against (that is, interfering with) the wire portion 90A of the groove forming tool 90 are deformed by the interference plane of the wire portion 90A to be folded to the position free from the interference, and consequently the brush bristle materials 35 protrude outward through between the wire portions 90A.

[0082] In the front ends of the brush bristle materials 35 of the brush body 33 in such a state that the groove forming tool 90 is fitted into the brush body 33, based on the positional relationship between the positions where the brush bristle materials 35 each protrude outward from the core material 36 and the wire portions 90A of the groove forming tool 90, the protruding state is formed so that the front ends of the brush bristle materials 35 protrude outward through a gap between the wire portions 90A of the groove forming tool 90.

[0083] As shown in FIG. 13C, the brush body 33 in such a state that the groove forming tool 90 is fitted into the brush body 33 is placed in a heating and processing device separately, and an electric current is applied to the wire of the groove forming tool 90, whereby Joule heat is generated from the wire.

[0084] In the above heat processed state, since the brush bristle materials 35 of the brush body 33 is formed of a synthetic resin material having thermoplasticity, the brush bristle materials 35 are thermoplastically deformed, whereby based on the fact that the wire portion 90A of the groove forming tool 90 is wound helically, such a forming processing is performed that the helical shape of the wire portion 90A remains the folded trace at the outer periphery of the brush

bristle materials 35 of the brush body 33.

[0085] After the above forming processing, when the groove forming tool 90 is removed from the brush body 33, as shown in FIG. 13D, the trace of the wire portion 90A of the groove forming tool 90 as the transverse grooves 38 obliquely crossing the axis line of the core material 36 is formed at the outer periphery of the brush body 33 constituted of the brush bristle materials 35 of the brush body 33 (FIG. 13A).

[0086] In this way, in the brush portions 34, a plurality of the transverse grooves 38 radially extending from the core material 36 are formed in the radial brush bristle materials 35 by the processing using the groove forming tool 90, and the grooves forming tool 90 is removed after the processing, whereby the brush portions 34 are free from the groove forming tool 90.

(Use of mascara brush)

[0087] In the mascara brush 31, the brush bristle materials 35 of the brush body 33 are scraped by a scraping member of an application liquid container, whereby the brush body 33 is removed from the application liquid container while an extra application liquid is scraped off.

[0088] At that time, since the transverse grooves 38 with a relatively large width are formed in the brush body 33, the transverse grooves 38 hold a large amount of the application liquid. The brush portions 34 have a plurality of the transverse grooves 38 radially extending from the core material 36, and the brush portions 34 can hold a large amount of an application liquid or a cleaning liquid by virtue of the transverse grooves 38, so that the application liquid can be applied to eyelashes, or the eyelashes can be cleaned with the cleaning liquid. Since the groove forming tool 90 is removed from the brush portions 34, the brush portions 34 are free from the groove forming tool 90, so that the weight is reduced, resulting in ease of use.

[0089] In the present embodiment, in the brush portions 34, an electric current is applied to the wire of the groove forming tool 90, and Joule heat is generated from the wire to perform heating, whereby a plurality of the transverse grooves 38 radially extending from the core material 36 are formed in the radial brush bristle materials 35. Pressurization is performed by the wire of the groove forming tool 90, so that the transverse grooves 38 radially extending from the core material 36 can be formed. Further, a male mold having protrusions for use in forming grooves and a female mold having recesses corresponding to the protrusions are used as a groove forming tool, and the brush body 33 is inserted into between the male and female molds to be pressurized, whereby the transverse grooves 38 radially extending from the core material 36 may be formed.

[0090] Further, ultrasound or a high frequency wave may be applied to the radial brush bristle materials 35 of the brush portions 34 to have the brush bristle materials 35 be plastically deformed by the ultrasound or the high frequency wave, whereby a plurality of the transverse grooves 38 radially extending from the core material 36 may be formed in the brush portions 34.

[0091] In the present embodiment, in the brush portions 34, a plurality of the transverse grooves 38 radially extending from the core material 36 are formed in the radial brush bristle materials 35 by the processing using the groove forming tool. Since the groove forming tool is removed from the brush portion 34, the brush portion 34 is free from the groove forming tool, so that the weight is reduced, resulting in ease of use. Further, in the present embodiment, in the brush portion 34, the transverse grooves 38 radially extending from the core material 36 are formed in the radial brush bristle materials 35 by the processing using the groove forming tool, and although the groove forming tool is removed from the brush portion 34, the groove forming tool remains attached to the brush portion 34 depending on the groove forming tool such as a coil spring-shaped groove forming tool. The mascara brush may be used while the groove forming tool is attached to the brush portion 34.

[Fifth embodiment]

[0092] Next, the fifth embodiment will be described based on FIGS. 14 and 15. In the fifth embodiment, in the brush portion 34, the core material 36 is held by a brush cover 91, whereby a plurality of the transverse grooves 38 radially extending from the core material 36 are formed in the radial brush bristle materials 35, and the brush cover 91 remains attached to the brush portion 34. In the present embodiment, a plurality of the transverse grooves radially extending from the core material are provided at the brush portions of the first to third embodiments.

[0093] The brush cover 91 of the present embodiment is formed of a metal material having an approximately circular-shaped cross section and extending longitudinally in the lengthwise direction shown by the arrow a and has a structure that the brush body 33 is inserted into the internal space of the brush cover 91. The brush cover 91 has on its upper side facing a plate portion 91A an opening 91B over the entire lengthwise direction shown by the arrow a. According to this constitution, when the brush body 33 is inserted into the brush cover 91, the brush bristle materials 35 of the brush body 33 protrude upward through the opening 91B.

[0094] Further, the brush cover 91 has a plurality of left notches 91L and right notches 91R provided respectively on

the left and right sides. The left and right notches 91L and 91R are sequentially formed along the lengthwise direction shown by the arrow a while holding therebetween left interference protrusions 91LX and right interference protrusions 91RX. Each of the front ends of the left and right interference protrusions 91LX and 91RX forms an acute angle, so that the left and right interference protrusions 91LX and 91RX easily insert into between the brush bristle materials 35.

[0095] According to the above constitution, while the brush body 33 is inserted into the brush cover 91, the brush cover 91 is bent by application of force from outside to inside the brush cover 91, whereby the front ends of the left and right interference protrusions 91LX and 91RX are first inserted into between the brush bristle materials 35, and some of the brush bristle materials 35, which correspond to the left and right notches 91L and 91R, protrude outward through the left and right notches 91L and 91R.

[0096] Some of the brush bristle materials 35 of the brush body 33, which suffer interference by being abutted against the left and right interference protrusions 91LX and 91RX, are folded so as to escape toward the left and right notches 91L and 91R adjacent to the left and right interference protrusions 91LX and 91RX to protrude outward from the left and right notches 91L and 91R.

[0097] While the brush body 33 is inserted into the brush cover 91, the brush cover 91 is bent by application of force from outside to inside the brush cover 91, whereby the front ends of the left and right interference protrusions 91LX and 91RX are inserted into between the brush bristle materials 35. In the brush body 33, the brush bristle materials 35 protruding outside from the left and right notches 91L and 91R constitute the brush bristle materials 35 protruding outward on the outer periphery, and the transverse grooves 38 are formed between the brush bristle material 35.

[0098] In this way, in the brush portion 34, the core material 36 is held by the brush cover 91, whereby a plurality of the transverse grooves 38 radially extending from the core material 36 are formed in the radial brush bristle materials 35. Since the brush cover 91 remains attached to the brush portion 34, the deformation of the transverse grooves 38 by the use is prevented, and the durability is enhanced.

(Variation 1 of fifth embodiment)

[0099] Next, a set of variations 1 of the fifth embodiment will be described based on FIG. 16. In the set of variations of the fifth embodiment, the brush body 33 is inserted into the internal space of the brush cover 91, and the brush cover 91 has, on its upper side facing the plate portion 91A, the opening 91B provided over the entire longitudinal direction shown by the arrow a. According to this constitution, when the brush body 33 is inserted into the brush cover 91, the brush bristle materials 35 of the brush body 33 protrude upward through the opening 91B. Further, the brush cover 91 has, only on its left side, a plurality of the left interference protrusions 91LX sequentially provided at predetermined intervals along the longitudinal direction shown by the arrow a. Each of the front ends of the left interference protrusions 91LX forms an acute angle, and the left interference protrusions 91LX easily insert into between the brush bristle materials 35.

[0100] According to the above constitution, while the brush body 33 is inserted into the brush cover 91, the brush bristle materials 35 protrude upward through the opening 91B, and the left interference protrusions 91LX are bent by application of force from outside to inside the brush cover 91 in this state, whereby the front ends of the left interference protrusions 91LX insert into between the brush bristle materials 35. The left interference protrusions 91LX are then bent so as to bridge over the opening 91B, whereby the brush bristle materials 35 protruding outside from the both side surfaces of the left protrusions 91LX constitute the brush bristle material 35 protruding outward on the outer periphery, and the transverse grooves 38 are formed between the brush bristle material 35.

[0101] This invention can be applied especially to a mascara brush, which is used for applying an application liquid such as mascara to hair to be applied with the application liquid and is used for cleaning the application liquid. With this mascara brush, when an application liquid is applied with the front ends of brush bristle materials, a large amount of the application liquid held in the mascara brush can be applied without the mascara brush being rotated, and when cleaning is performed with the front ends of the brush bristle materials, cleaning can be performed with a large amount of a cleaning liquid held in the mascara brush without the mascara brush being rotated.

[Explanation of reference numerals]

[0102]

1, 12, 21, 31 Mascara brush

2, 12, 22, 32 Grip portion

3, 13, 23, 33 Brush body

	4,14, 24, 34	Brush portion
	5, 15, 25, 35	Brush bristle material
5	6,16, 26,36	Core material
	7,17a, 17b, 27a, 37	Space
	38	Transverse groove
10	50	Forming tool
	60	Eyelash
15	90	Groove forming tool
	91	Brush cover

20 Claims

1. A mascara brush, which comprises a large number of brush bristle materials radially provided around a core material, comprising:
 - 25 a brush portion which comprises the radial brush bristle materials gathered around the core material and formed into a bundle along a core axial direction, wherein around the brush portion, there is a space around the core material along the core axial direction.
- 30 2. The mascara brush according to claim 1, wherein in the brush portion, front ends of the radial brush bristle materials are each pointed like a needle.
3. The mascara brush according to claim 1 or 2, wherein the brush portion comprises hook portions bent like hooks at the front ends of the radial brush bristle materials.
- 35 4. The mascara brush according to claim 1, wherein in the brush portion, as viewed from the core axial direction, a central portion of the radial brush bristle materials is long, and the radial brush bristle materials are gradually shortened from the central portion toward the sides.
- 40 5. The mascara brush according to claim 1, wherein a plurality of the brush portions are provided, and the brush portions are located symmetrically around the core material as viewed from the core axial direction.
- 45 6. The mascara brush according to claim 1, wherein a plurality of the brush portions are provided, and the brush portions are located at a position forming an acute angle with the core material as the center as viewed from the core axial direction.
- 50 7. The mascara brush according to claim 1, wherein a plurality of the brush portions are provided, and the brush portions are located at the positions of the vertexes of a polygon as viewed from the core axial direction.
8. The mascara brush according to claim 1, wherein a plurality of the brush portions are provided, and the brush portions are located at regular intervals along a circumference of a circle as viewed from the core axial direction.
9. The mascara brush according to claim 1, wherein a plurality of the brush portions are provided, and the brush portions are located at regular intervals along a circumference of a semicircle as viewed from the core axial direction.
- 55 10. The mascara brush according to claim 1, wherein in the brush portion, the radial brush bristle materials are processed by at least one of pressurization, heating, ultrasound, and high frequency wave to be gathered around the core material, and, thus, to be formed into a bundle along the core axial direction.

11. The mascara brush according to claim 1, wherein the brush portion comprises a plurality of transverse grooves radially extending from the core material.

5 12. The mascara brush according to claim 1, wherein in the brush portion, a plurality of transverse grooves radially extending from the core material are formed in the radial brush bristle materials by processing using a groove forming tool, and the brush portion is in a state where the groove forming tool is not attached thereto.

10 13. The mascara brush according to claim 1, wherein in the brush portion, the core material is held by a brush cover, whereby a plurality of transverse grooves radially extending from the core material are formed in the radial brush bristle materials, and the brush portion is in a state where the brush cover is attached thereto.

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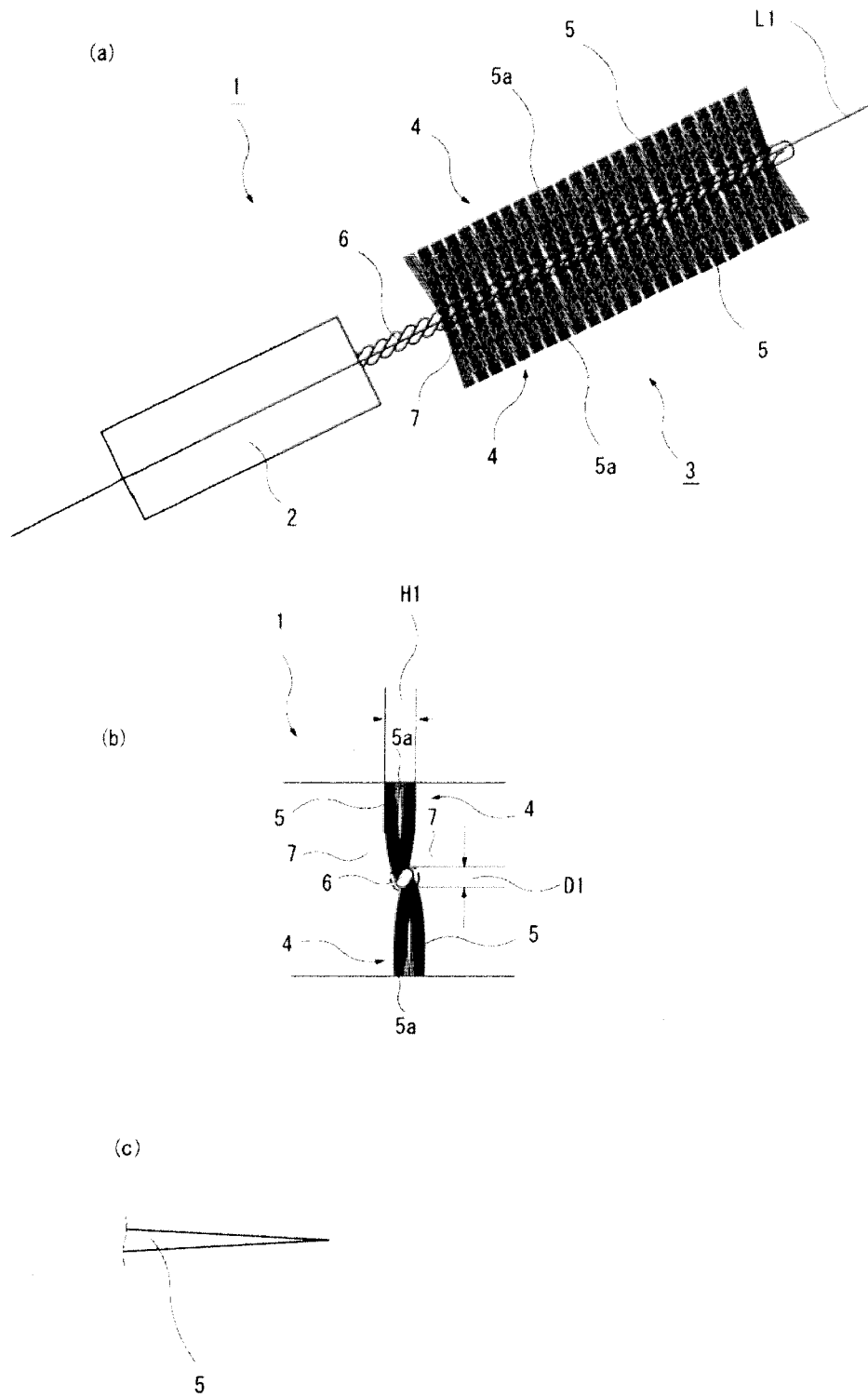


Fig.1

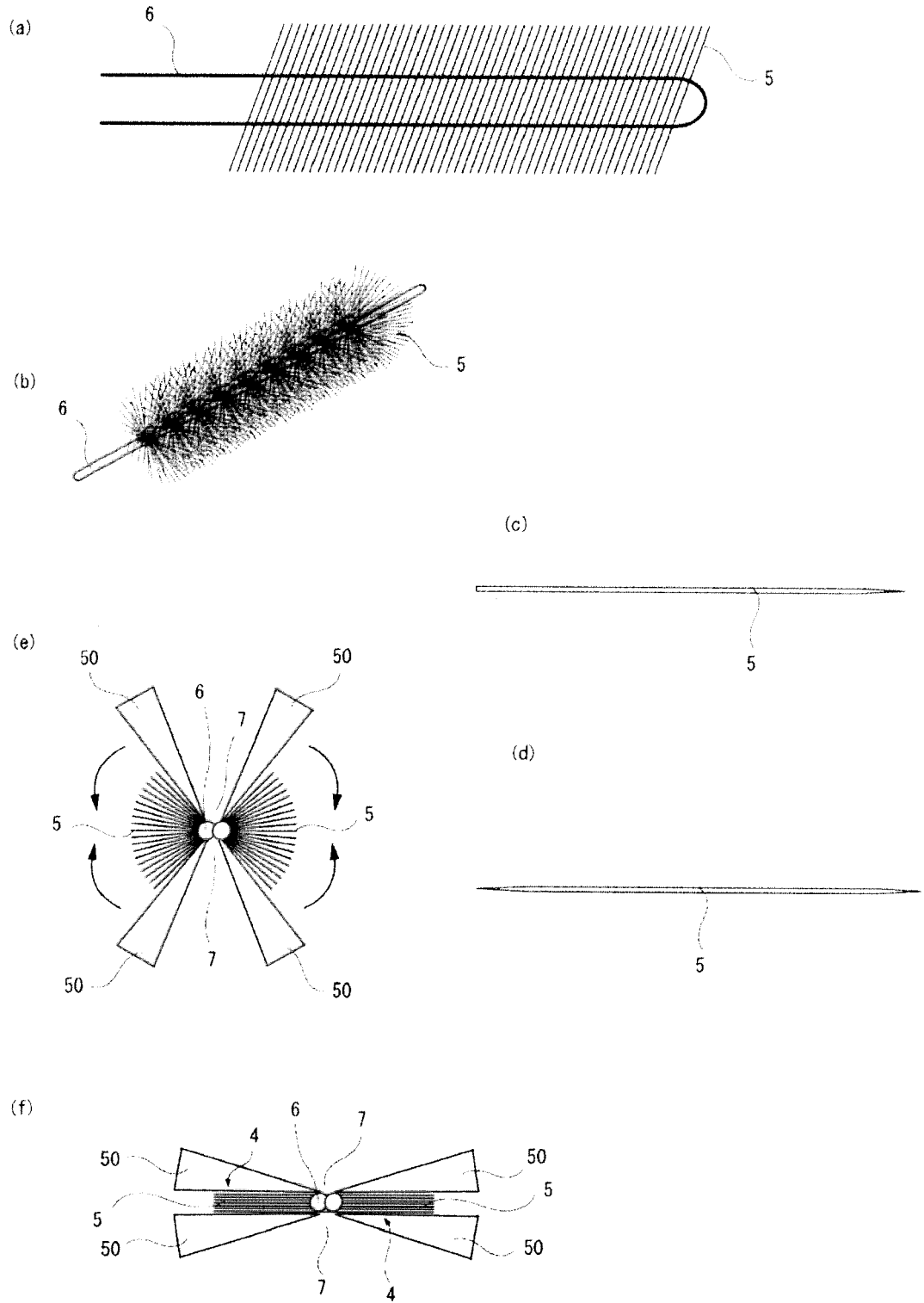


Fig.2

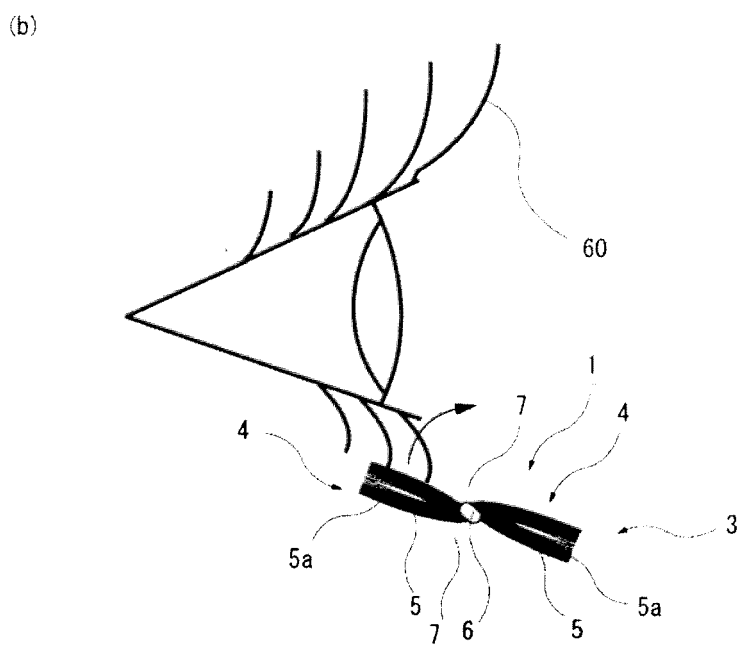
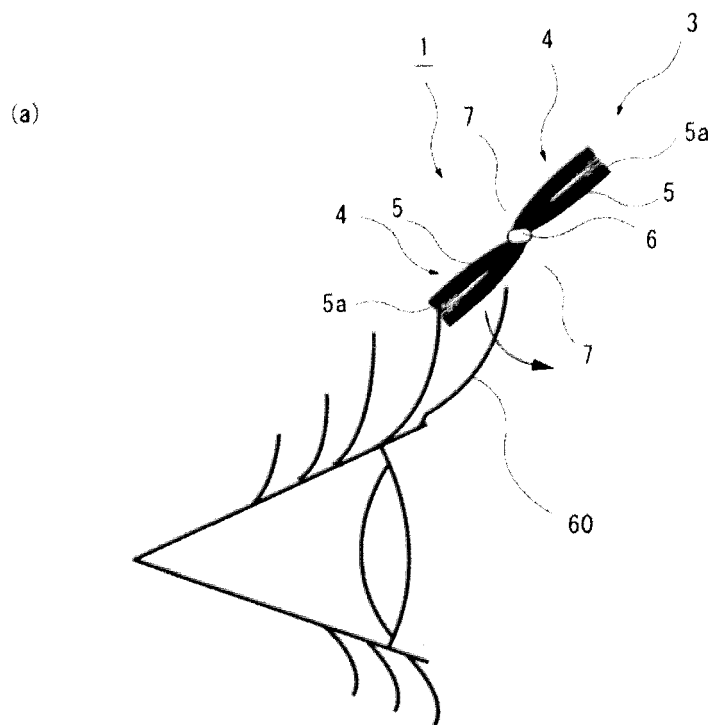


Fig.3

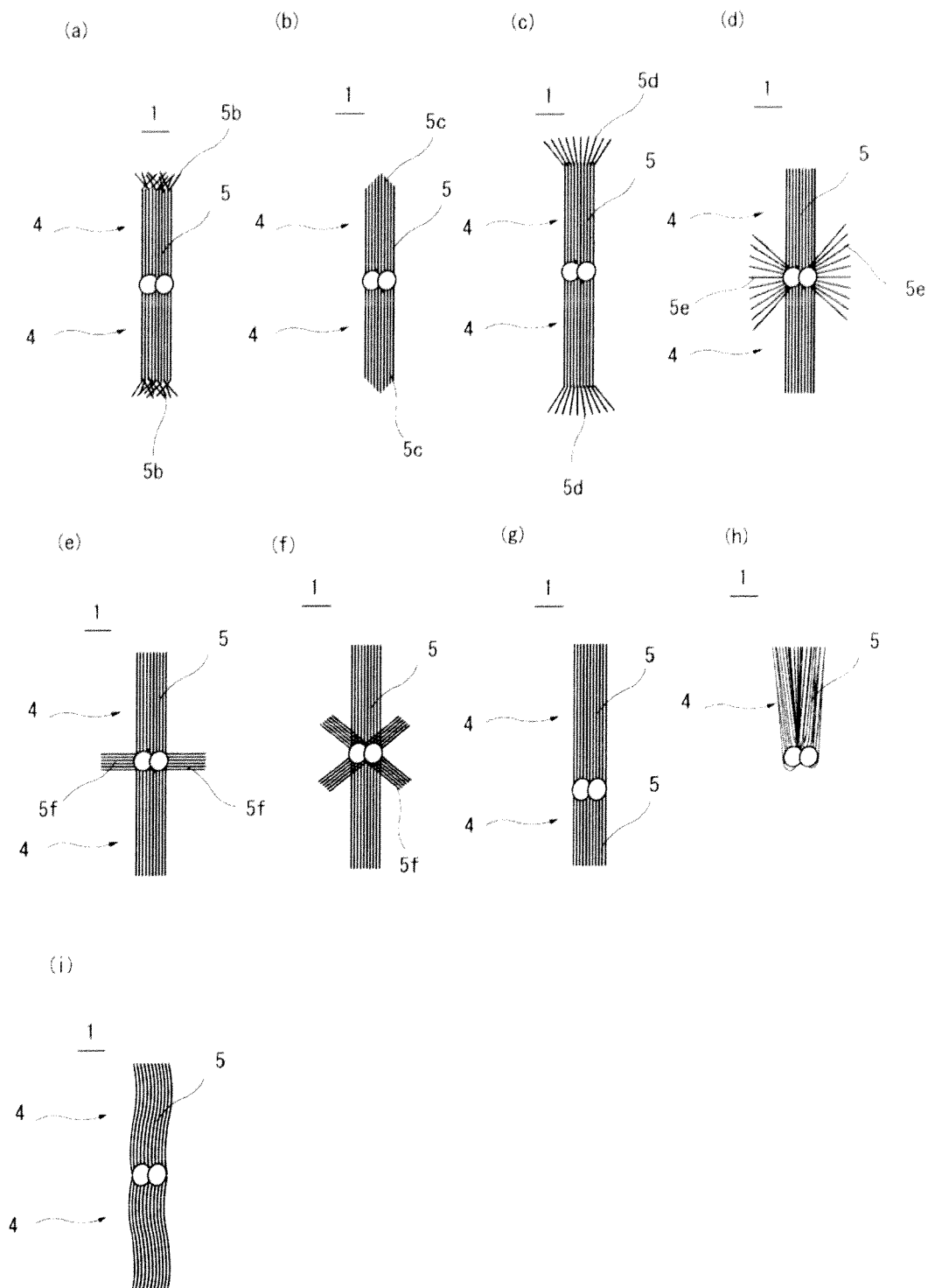


Fig.4

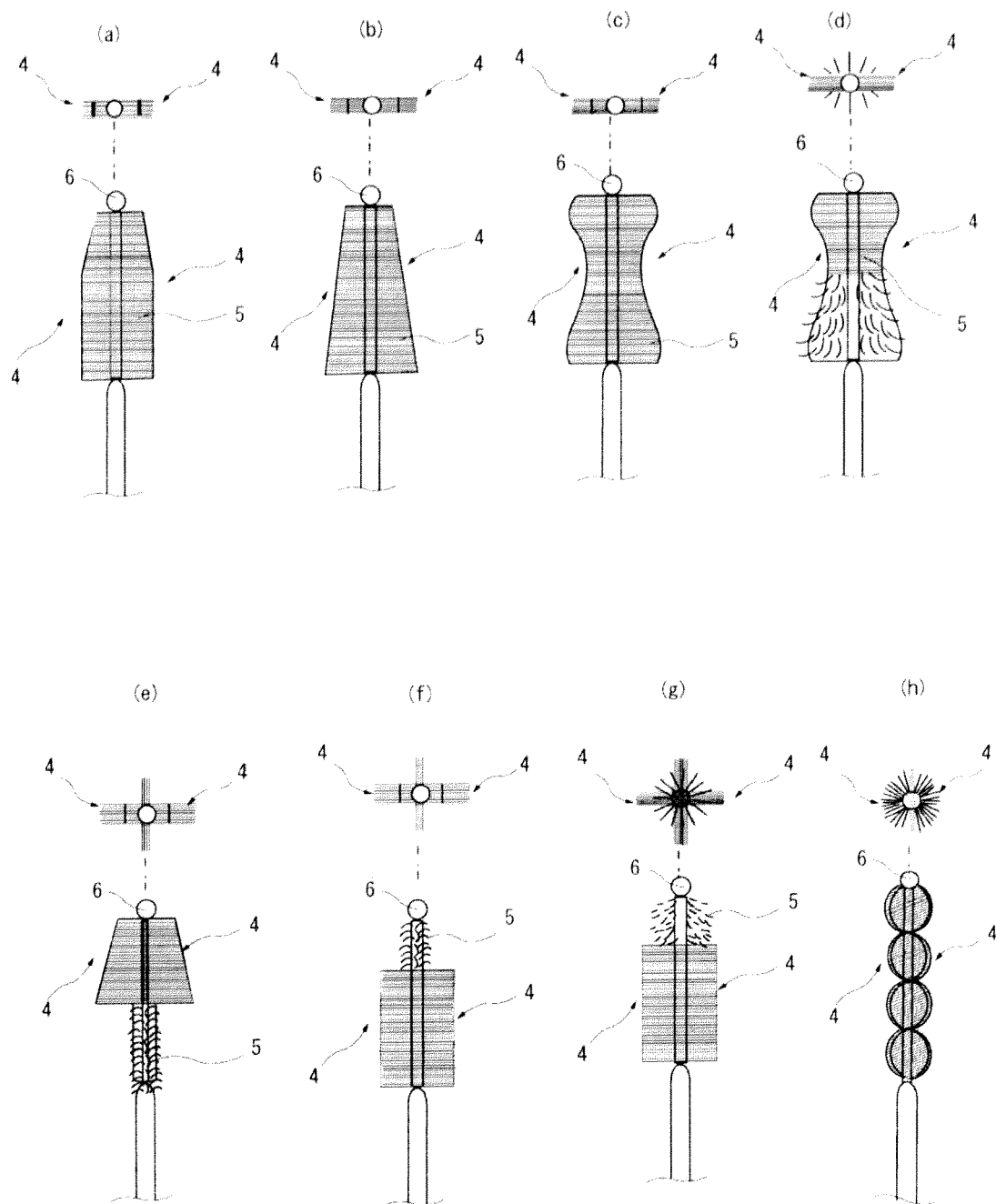


Fig.5

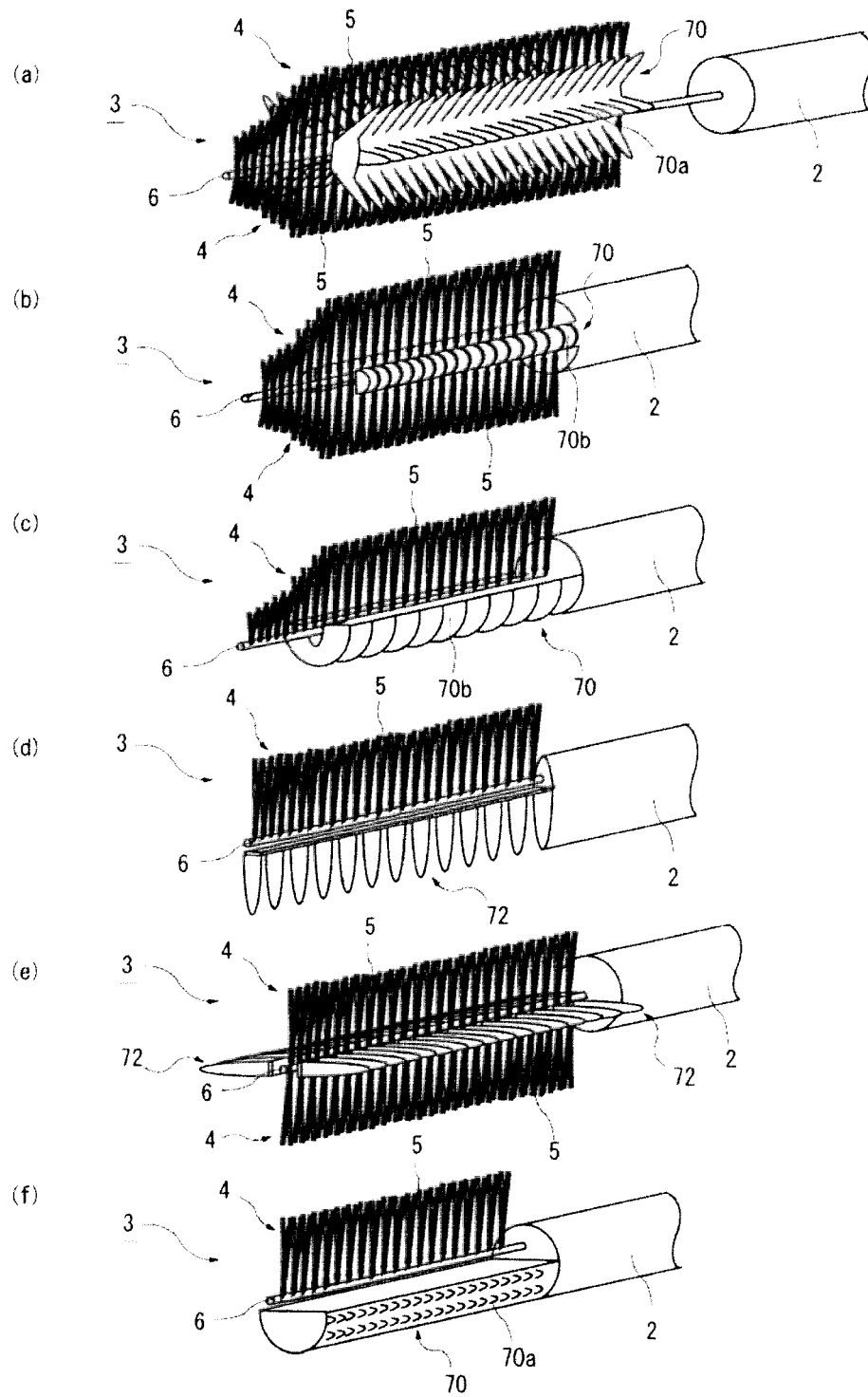


Fig.6

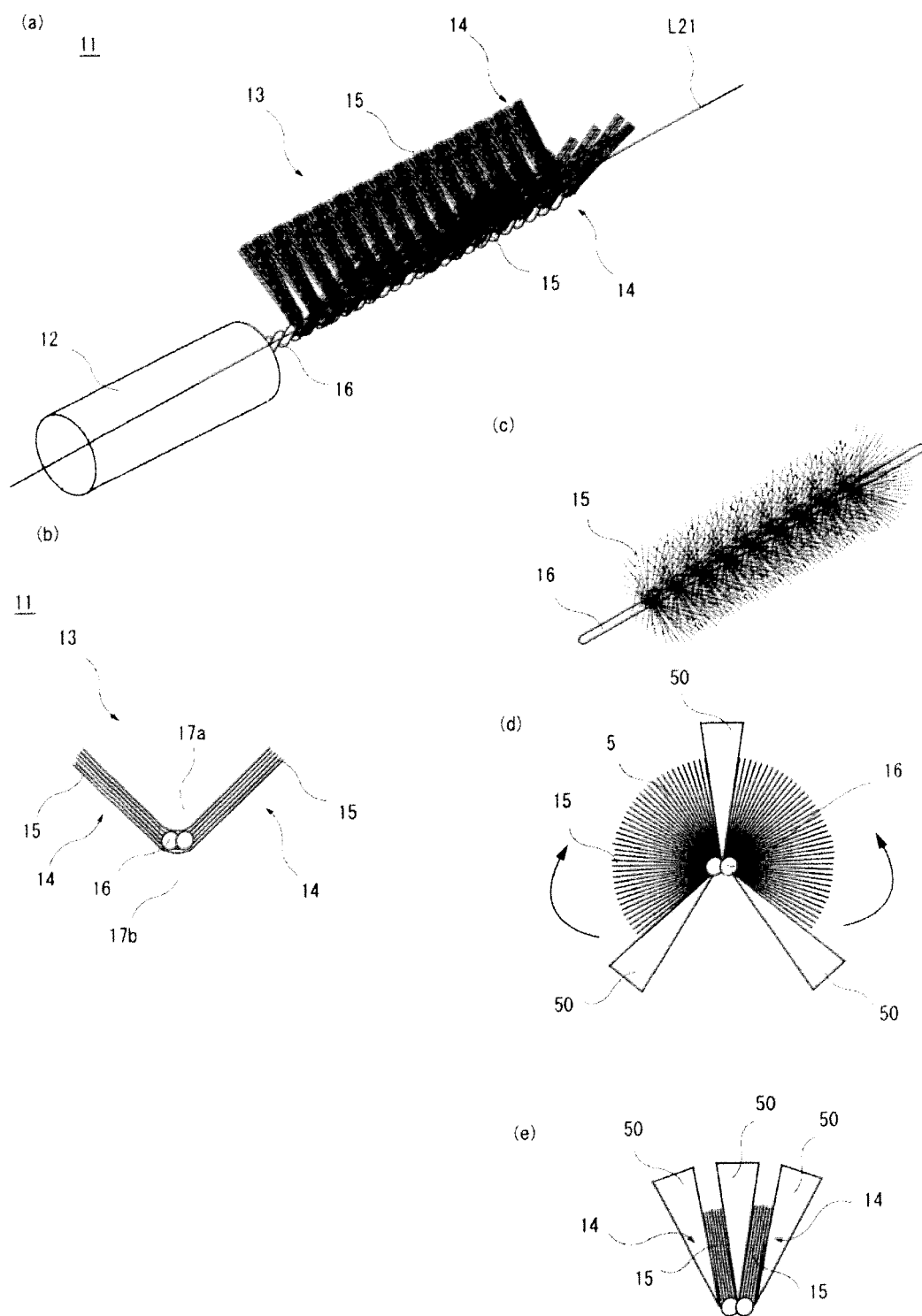
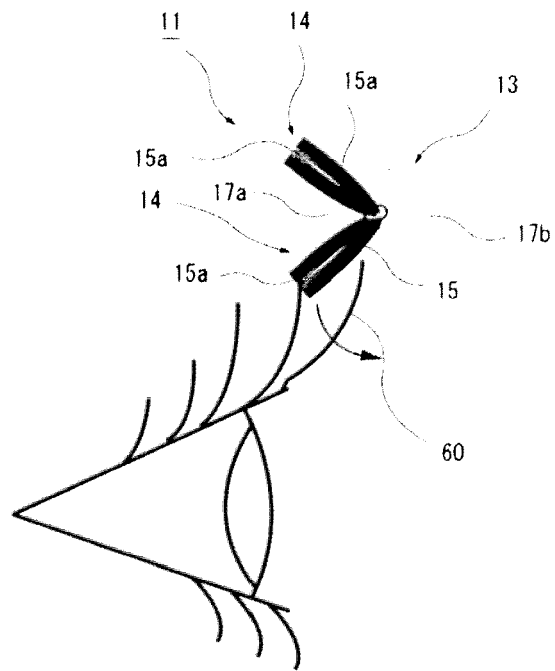


Fig.7

(a)



(b)

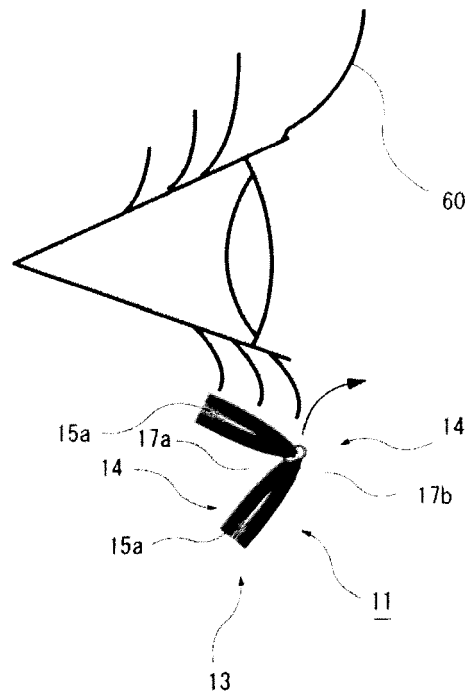


Fig.8

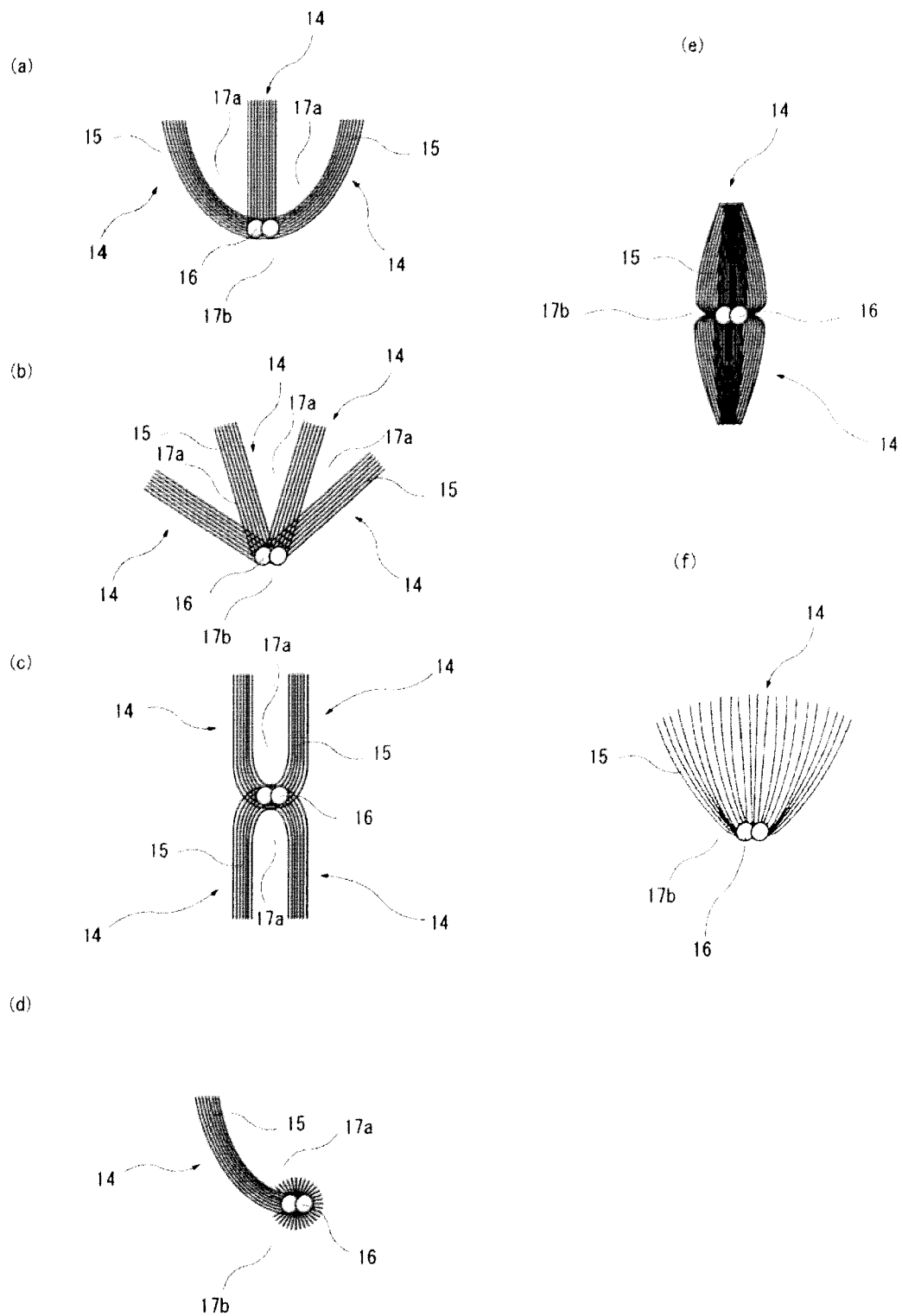


Fig.9

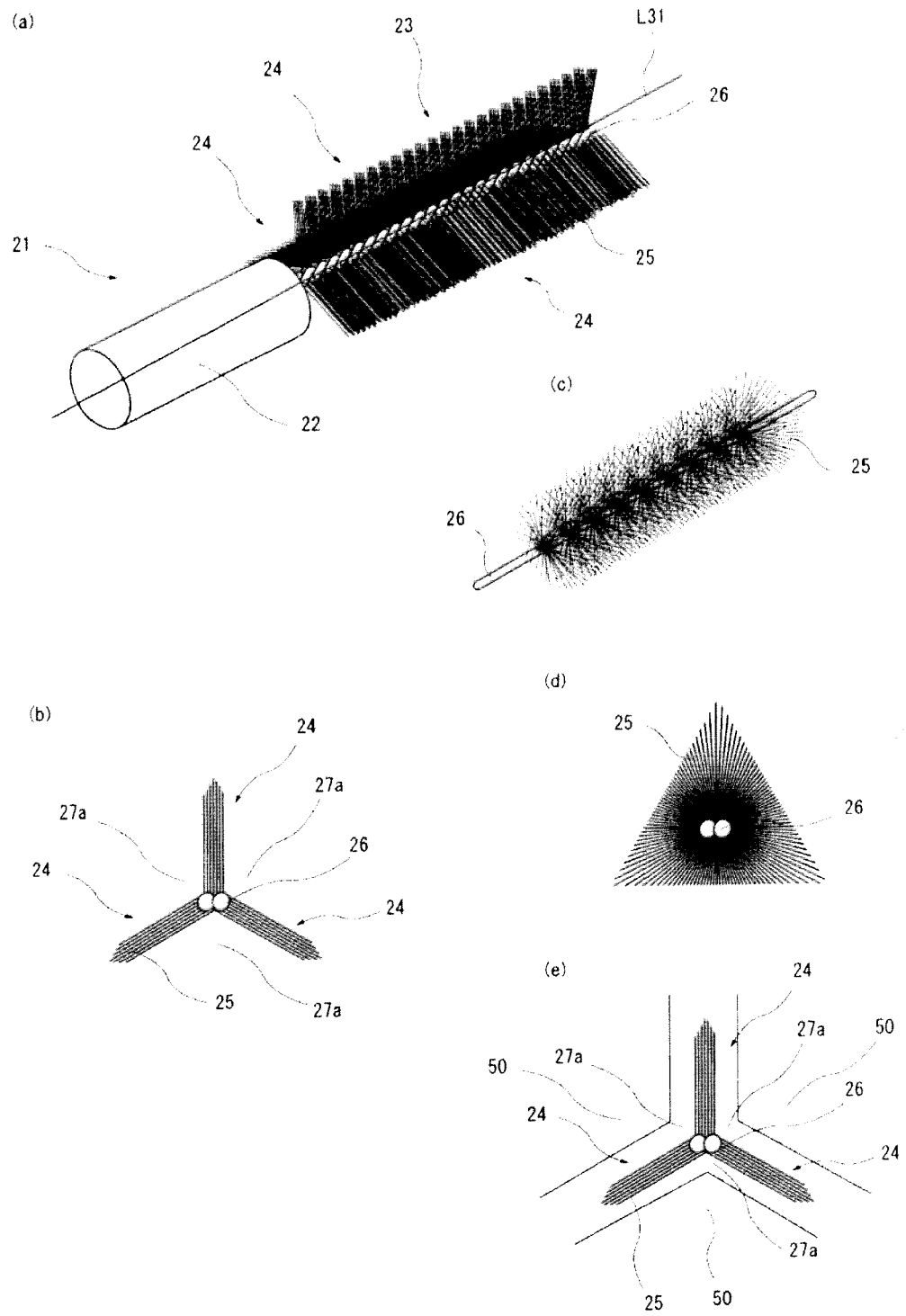


Fig.10

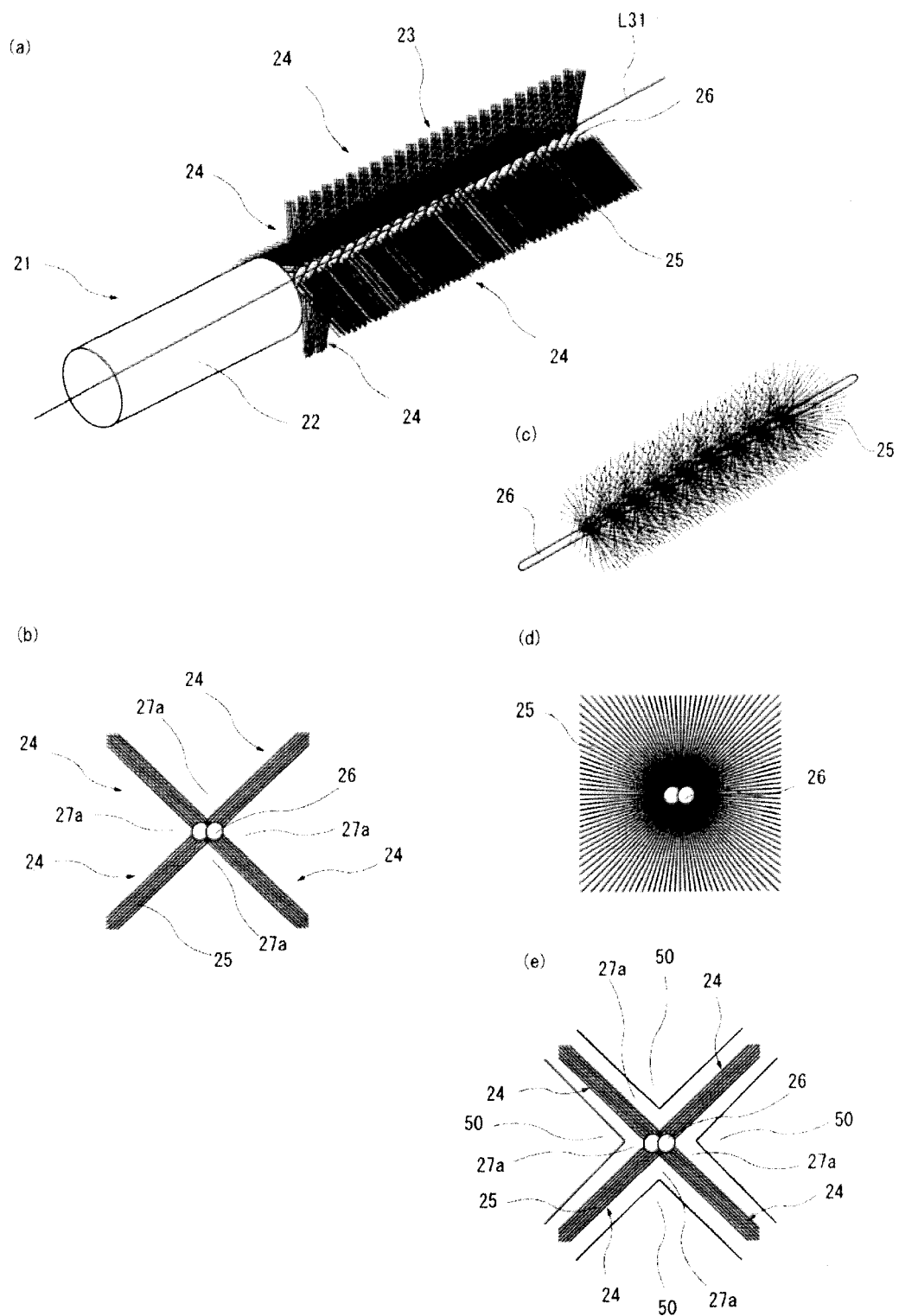


Fig.11

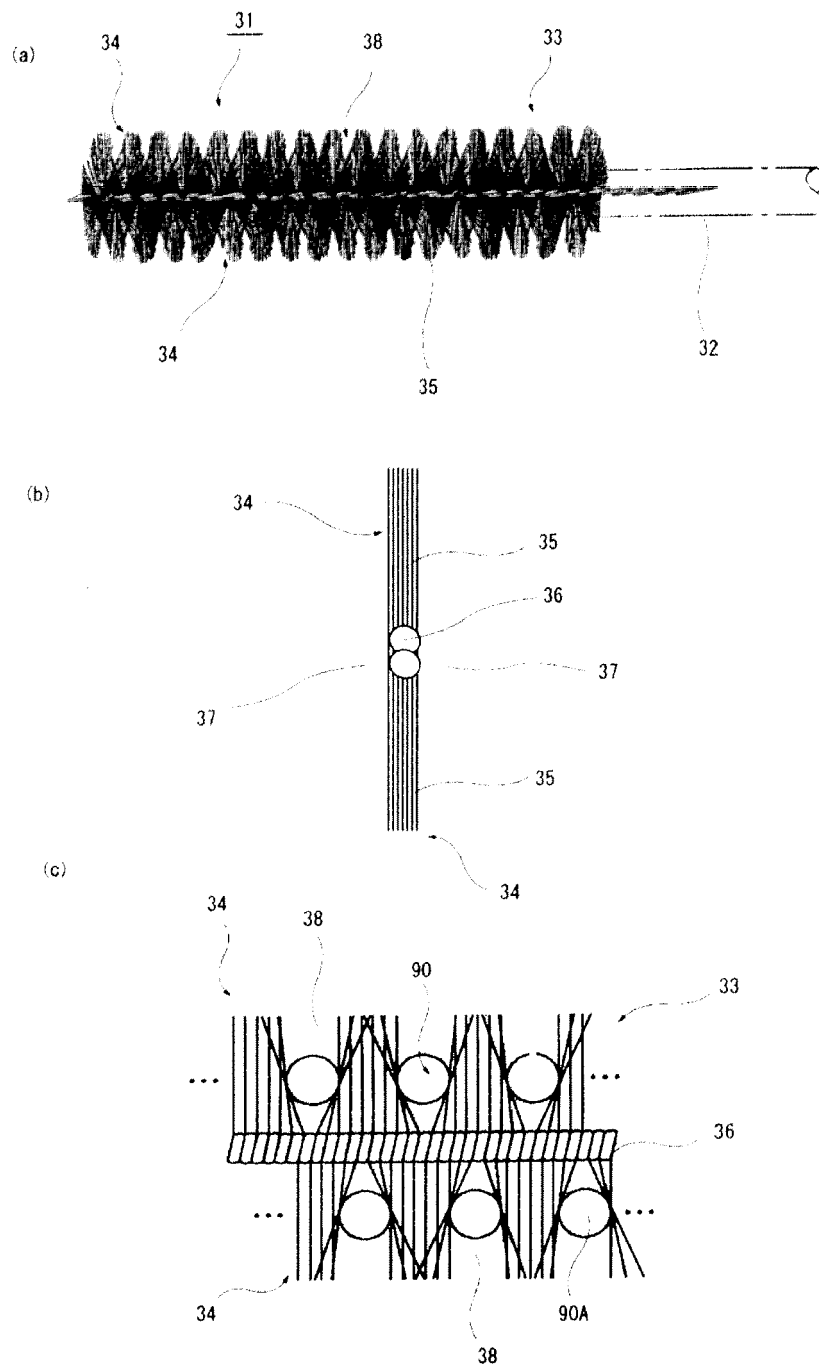


Fig.12

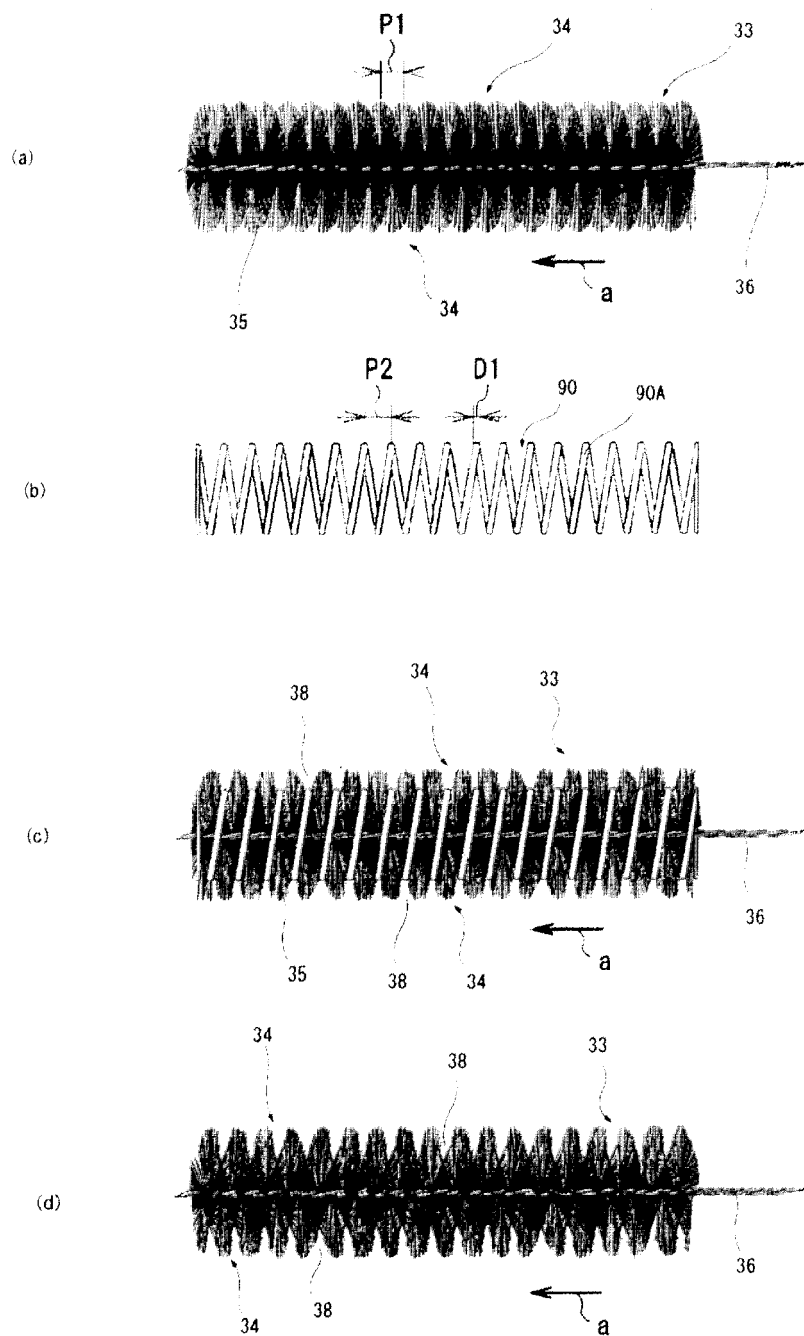
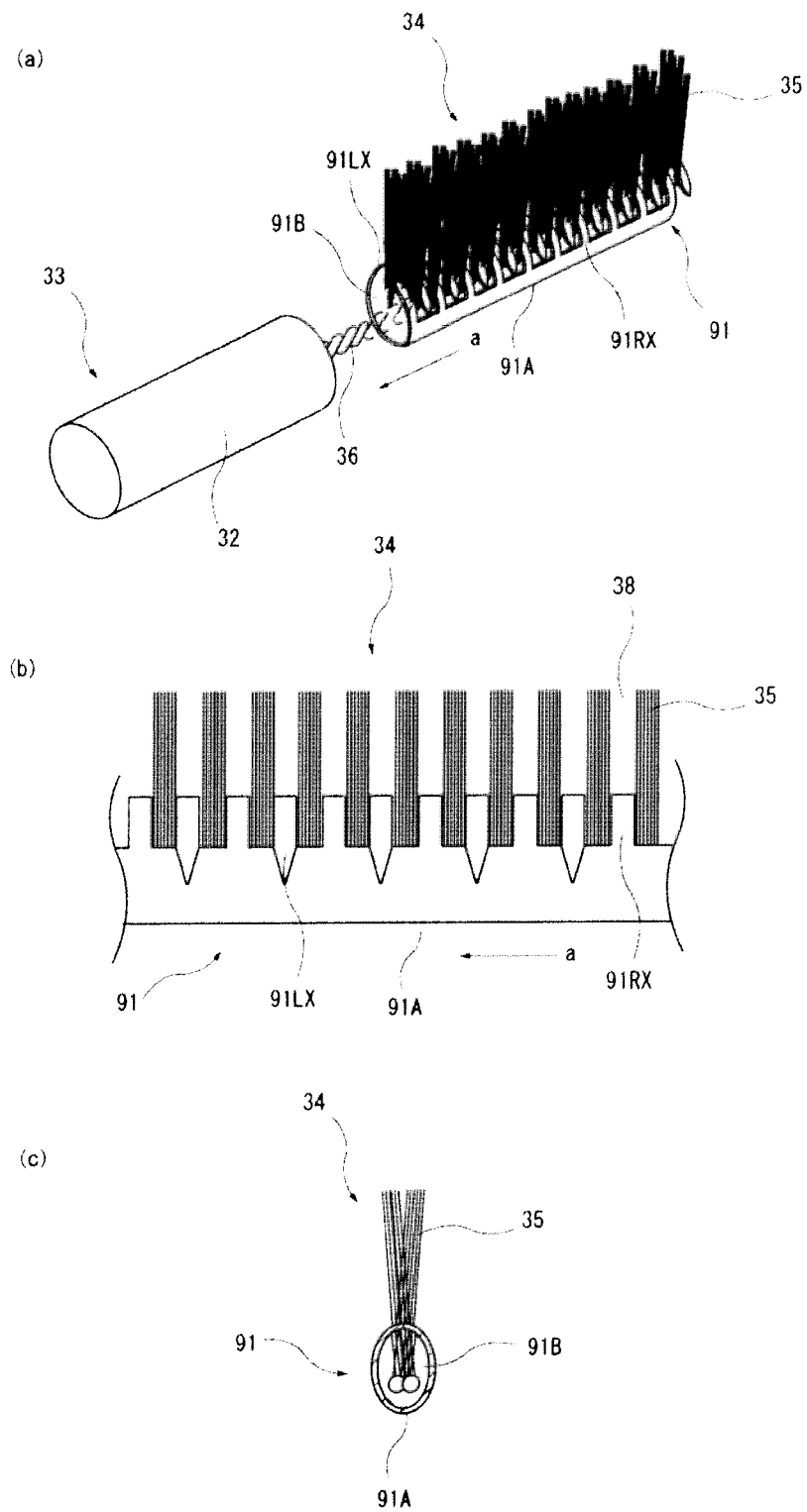


Fig.13



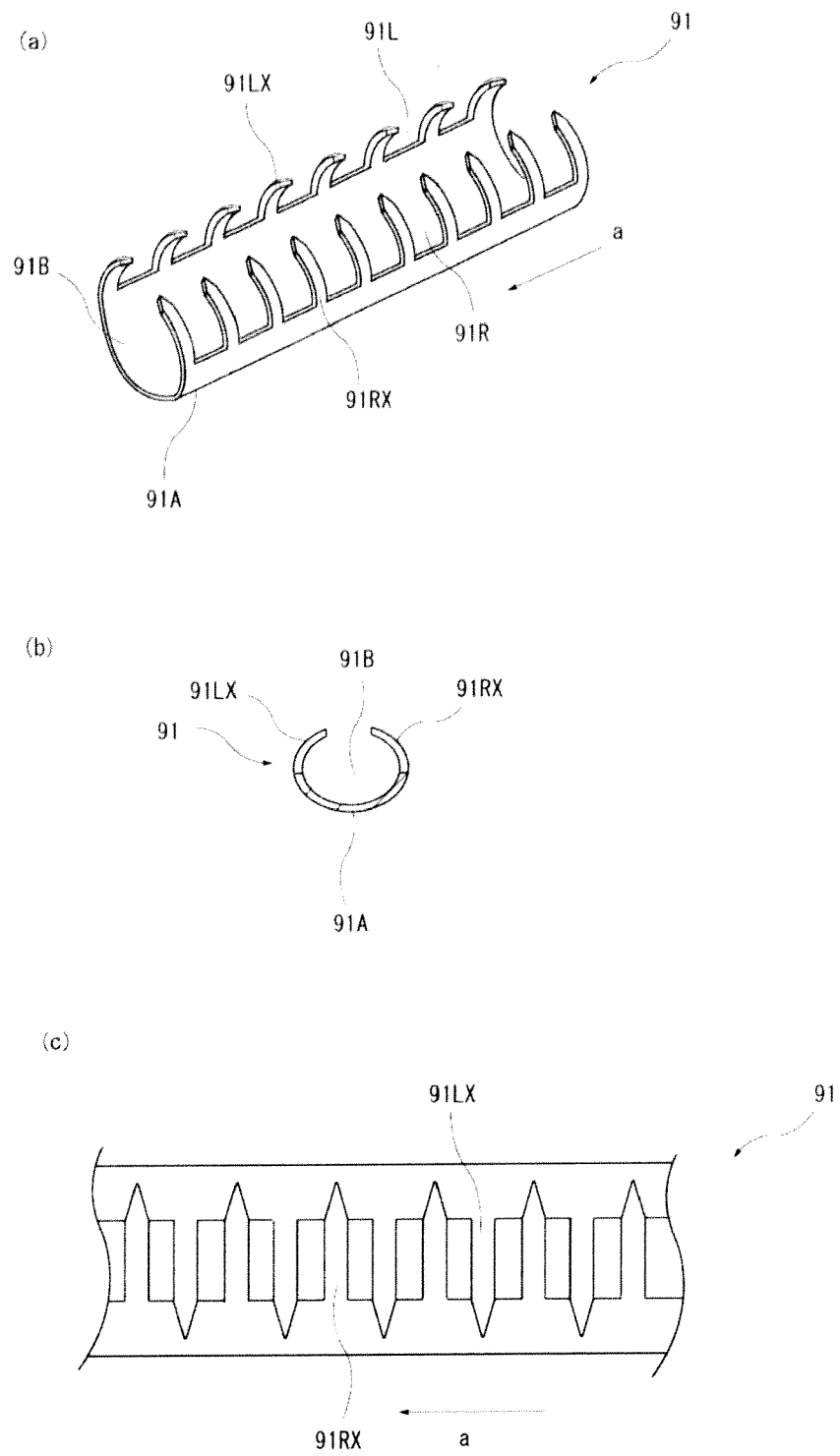


Fig.15

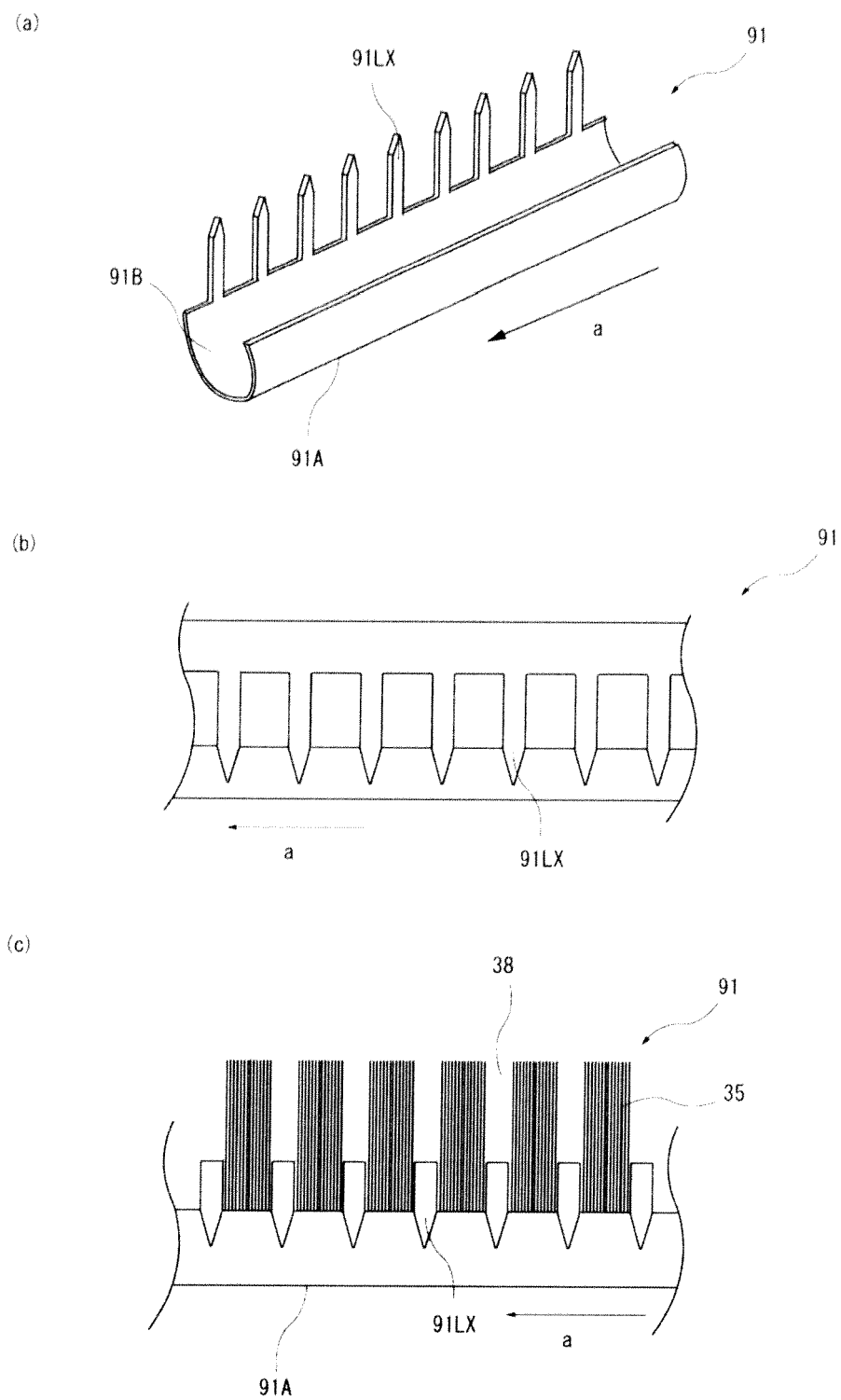


Fig.16



EUROPEAN SEARCH REPORT

Application Number
EP 10 17 2085

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Place of search Munich		Date of completion of the search 26 October 2011	Examiner Haller, E
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